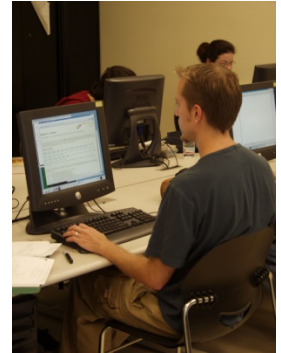


Shaping the Next Generation: Training and Education Needs for Providers (Roundtable)

National Conference on Building Commissioning
Newport Beach, California

April 23, 2008



Shaping the Next Generation: Training and Education Needs for Providers (Roundtable)

Opportunities and Pressures

- Increased energy costs / decreased availability
- Momentum in the sustainability movement
- Adjacent programs, such as the LEED family of products
- Changes in codes, standards and even laws that require commissioning activities

Shaping the Next Generation: Training and Education Needs for Providers (Roundtable)

Issues Addressed in Recent Study:

- What skills are required to be a commissioning provider?
- Can experience be taught?
- What training resources are required in the current industry environment?
- What training resources are currently available?
- How can these industry needs be met?

Shaping the Next Generation: Training and Education Needs for Providers (Roundtable)

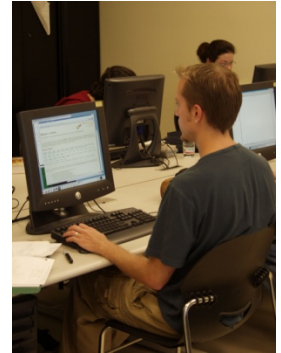
Program Agenda:

- Introduction
- Presentation of Nexant Study
- Roundtable Discussion
- Hand in Matrix Notes

Developing Educational Opportunities for Commissioning Providers

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Strengthening the Delivery Infrastructure

- Assumption: Need is likely to outstrip supply of qualified commissioning providers
- Objective: Identify actions that the CCC might take to help expand and prepare the commissioning work force in California
- Right now, initiatives to “green” the state through energy efficiency are springing up in government, on community college campuses, and among private businesses
- So ...What’s important in preparing a new generation of commissioning service providers?



What Do Providers, Educators, and Consumers Think?

- What skills do hiring firms want?
- What education and training do hiring firms want or expect?
- What opportunities for education and training in commissioning are available now?
- What are current commissioning supply needs?
- What options are there for expanding the commissioning work force?



Interviewees

- Current commissioning providers
- Building owners and facility managers
- Managers of utility RCx programs
- Educators at colleges and utility-sponsored training centers
- Presenters of training through professional associations



Responses: Skills and Expertise

■ Education

“More than 99% of engineering students never get any hands-on experience with HVAC equipment”

■ Expertise

“It takes 20 years of experience to be a senior Cx Agent”

■ Certification

“Experience matters more”
“Multiplicity is confusing to owners”

■ Cx & RCx

“There’s good consensus about how to do Cx, but a lack of consistency about RCx”



Responses: Education / Training Wish List

- Two-year programs at Community Colleges

“One year on coursework for RCx, one year as an intern, and an additional semester for Cx design component”

- Labs or field experience

“You really can’t do the work without field experience”

“Create an HVAC systems lab”

- More attention to documentation of RCx projects

“Documentation is a challenge in the industry—it’s not just a checklist”

- On-demand on-line tutorials, with Q&A



- Collaborative teaching

“Use industry guest lecturers or team teaching”

Responses: Current Learning Opportunities

- Four-Year Colleges
 - Focus on fundamentals
- Two-Year Community Colleges
 - Emphasize hands-on
- Internships
 - Calls for school - industry collaboration
- On-the-Job
 - Some, mainly by attending workshops, Webinars, professional association, or college-level extension courses
- Unions
 - High volume programs in specific areas
- Model Programs



Responses: Critical Supply Needs

■ Overall

- Help meet energy efficiency goals
- Offset loss of experienced consultants and staff through retirement

■ Levels: Shortest supply described as “technicians” and “mid-range”

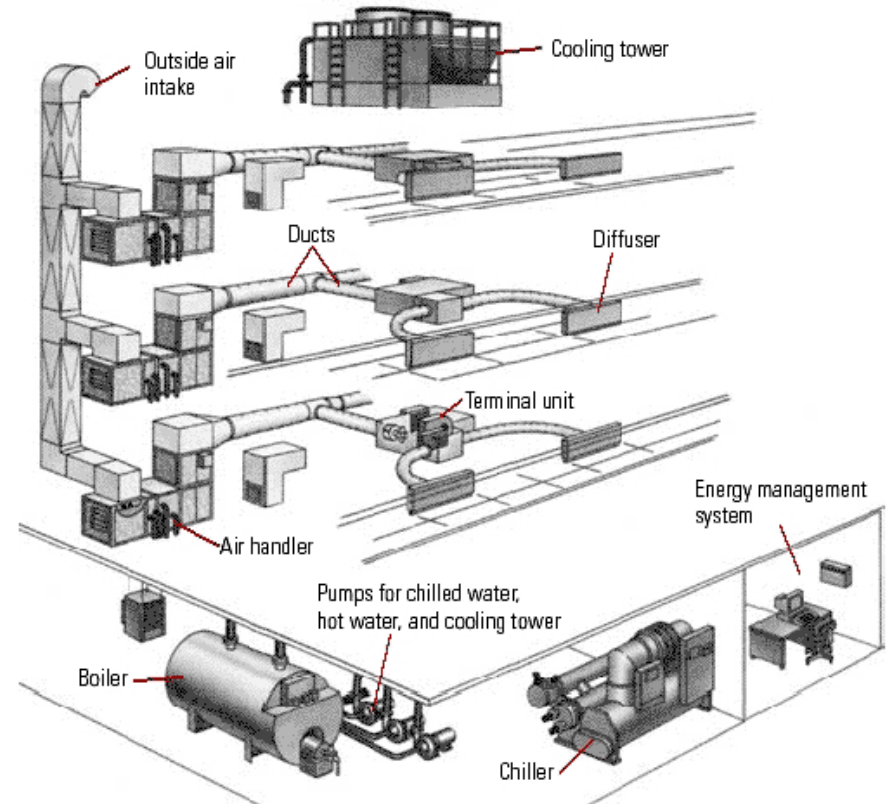
■ No quantitative assessment yet

- CCC is quantifying need for commissioning agents in California
- NEEC is conducting an industry-wide assessment (energy efficiency focus)



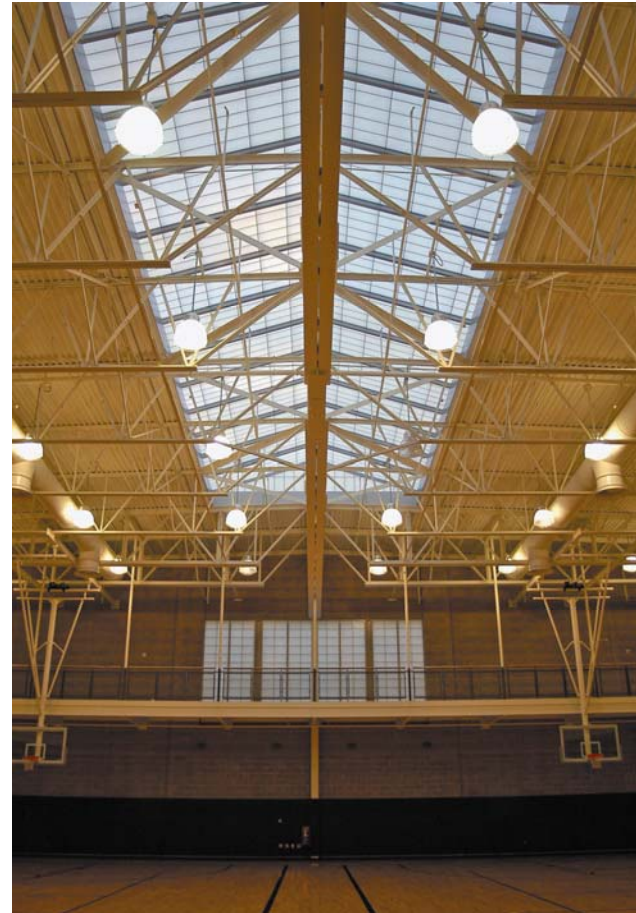
Responses: Skills Hardest to Find

- “The typical engineer doesn’t have adequate training in controls systems, controls logic”
- “Not nearly enough people have both controls and HVAC experience”
- “In colleges there seem to be no courses in mechanical systems”
- Diagnostic skills (“Getting from the fundamentals to evaluating an existing system”)
- Combination of analytical and fix-it skills (“We tend to get one or the other”)
- Data analysis skills, among technicians
- Engineering economics and life-cycle analysis



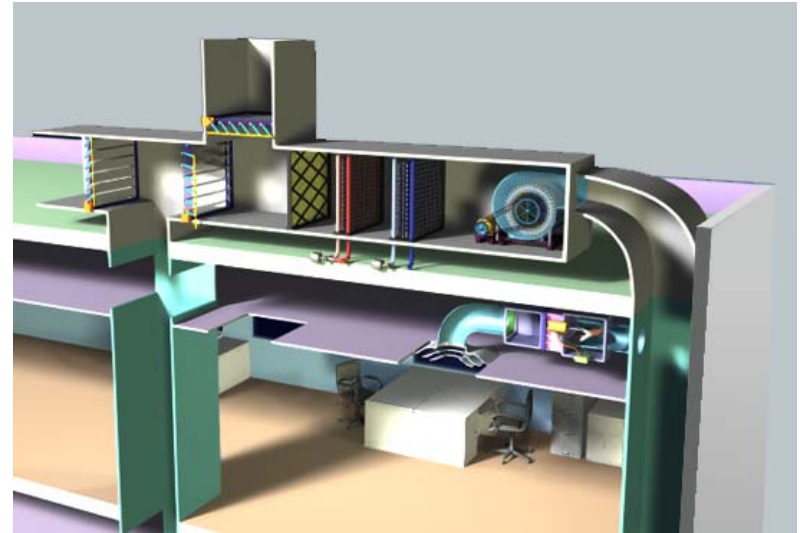
Options for Expanding the Commissioning Work Force

- Education
- Marketing and Public Relations
- The Web
- Public Sector Agencies
- Standards



Recommendations: Education

- Convene a workshop of faculty, industry experts, and others to brainstorm curriculum development
- Create a central information source (e.g. password-protected website) to provide resources for colleges developing new programs
- Collaborate to maximize information dissemination and avoid overlap (colleges and universities, DOE, BOC, BOMA, IFMA, and others)
- Promote boot camps for professional development
- Maintain support for utility energy centers



- Design a replicable internship program and identify funding

Education: Model Programs

■ Two-Year Community Colleges

- Lane Community College Commercial Energy Analysis Program (Eugene, OR)
- Laney College Environmental Control Technology Program (Oakland, CA)
- Future (2008?) multi-college Internet-based curriculum with local labs (initiated by Lane Community College)

■ Four-Year Colleges

- DOE-sponsored Industrial Assessment Centers (nationwide)

■ Professional Advancement

- Pacific Energy Center (San Francisco)
- Lane Community College Summer Session “boot camp”



Recommendations: Marketing and Public Relations

- Use publicity to create awareness of career opportunities, attract professionals with related skills, alert facility owners and managers to available training resources
- Place articles in professional and trade journals to broaden recognition of the field
- Link commissioning with “sustainability”: A strong force that the commissioning industry can use to its advantage
 - Grow more business
 - Reduce energy use
 - Get support for strengthening the service delivery infrastructure



Recommendations: Public Sector Agencies

- Educate policy makers on the industry's needs
 - Job recognition: Community colleges rely on state jobs forecasts – no Cx/RCx agent category
- Be sure that commissioning is incorporated in state-funded energy education plans
 - E.g., in California as part of the Governor's commitment to create “20,000 New Engineers” in the next decade



Recommendations: Standards

- Create an industry standard for RCx
 - Form an industry-based working group to create one standard process
 - “[Utility] programs that focus on energy savings leave out a lot of scope that is fundamental to RCx”
- Collaborate with current initiatives
 - ASHRAE commissioning certificate program
 - California utilities initiative to “reshape the HVAC industry”



Theme: Collaboration: Industry, Colleges, Utilities

■ Share

- Information
- Contacts
- Experience
- Existing programs
- Curriculum
- Tools

■ Achieve

- Economies of effort
- Maximized benefits



Critical Connections for Work Force Expansion

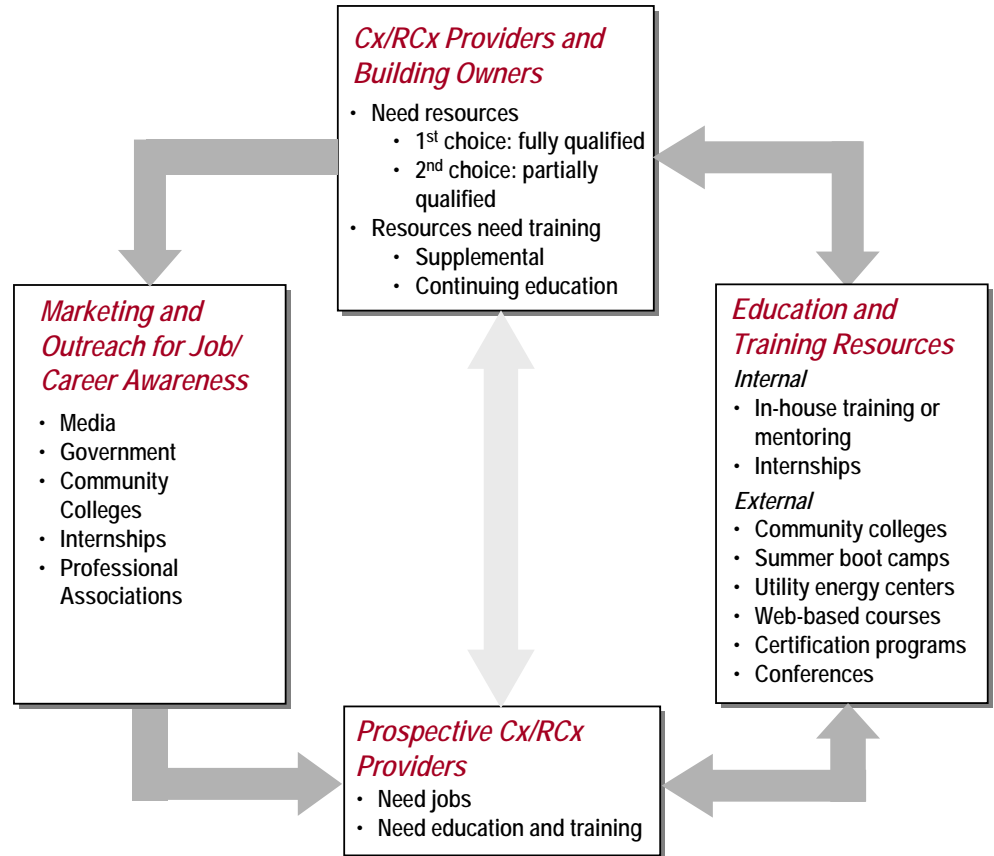
Connect people, businesses,
and institutions that have
expertise and resources with

...

those who need them

- students
- re-entry workers
- persons seeking professional advancement
- and educators ...

to meet the need for qualified
commissioning providers



Ferment in the Industry and the Country

What's Happening Already?

- Statewide Work Force Education and Training Strategies (California utilities)
- Community colleges:
 - New energy programs
 - Conference on Economic & Workforce Development through California Community Colleges
 - LA Community College District Annual Sustainability Conference
- Green California Summit (<http://www.green-technology.org/gcsummit.htm>)
- Apollo Alliance (www.apolloalliance.org)
- Private businesses: CB Richard Ellis and NRDC
- Federal government: Green Jobs Act of 2007
- Alliance for Climate Protection (<http://www.wecansolveit.org/>)
- Great web resources
 - www.cacx.org
 - <http://buildingcommissioning.wordpress.com>
 - <http://www.energydesignresources.com/category/commissioning/>

Contact:

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See the California Commissioning Collaborative
web site (www.cacx.org)
for more details on the options identified during the
research, plus lists of events, organizations,
websites, and other resources



What's Next?

Shaping the Next Generation: Training and Education Needs for Providers

List desired / expected capabilities of each participant in identified work environment.

Participant	Commissioning Field Work	Retro-commissioning Field Work	In-Office Support
Junior Commissioning Person			
Senior Commissioning Person			
Administrative Personnel			
	Junior Commissioning Person	Senior Commissioning Person	Cx Administrative Personnel
How Much Experience Does Each Participant Have? (# of years)			

Shaping the Next Generation: Training and Education Needs for Providers (Roundtable)

Discussion Topics:

- Who needs to be trained in today's commissioning environment?
- From what part of the industry do they come?
- What is that individual's experience?
- What courses are needed based on the current environment?
- What specific capabilities does that individual require in the field?
- What is the biggest aspect of the commissioning industry that your company is not able to capitalize on – and why?