Related Online Resources:

**Advanced Variable Air Volume System Design Guide**

**American Society of Heating Refrigerating and Air-Conditioning Engineers (ASHRAE)**
ASHRAE is a professional organization dedicated to the creation and promotion of excellent standard practices in the HVAC&R industry. Members have access to ASHRAE technical articles and conference papers. Everyone can browse abstracts of ASHRAE's numerous books, journal articles and other technical publications that are available for purchase.
[http://www.ashrae.org](http://www.ashrae.org)

**AutomatedBuildings.com**
Articles on many aspects of building controls, interviews, training opportunities, and control product reviews are among the resources available on this building automation-focused Web site.
[http://www.automatedbuildings.com](http://www.automatedbuildings.com)

**Consortium for Energy Efficiency (CEE). Commercial HVAC Installation Guidelines**
Both the *Guidelines for Energy-Efficient Commercial Unitary HVAC Systems* and the accompanying *White Paper* can be downloaded from CEE’s site. The Guidelines provide best practices, selection criteria, and details of components and systems. HVAC commissioning is also outlined and discussed.

**Control Engineering**
Control Engineering covers many aspects of controls and their applications. Registration is required for a free subscription to the magazine. Articles, newsletters, white papers, case studies, and product information are available to everyone.

**Cooling Technology Institute (CTI)**
CTI promotes the use of Evaporative Heat Transfer Systems that have minimum impact on the environment. This site includes information about CTI’s certification program, ToolKit software for cooling tower performance analysis, and purchasing information for CTI’s publications and papers.
[http://www.cti.org](http://www.cti.org)
**CoolTools™ Chilled Water Plants Design Guide**
This design guide from the CoolTools chilled water plants project can be downloaded from the publications section of the Taylor Engineering site.
http://www.taylor-engineering.com/publications/design_guides.shtml

**CtrlSpecBuilder**
This is a free online tool that assists with the specification writing process for HVAC control systems. The format is based on ASHRAE Guideline 13-2000.
https://www.ctrlspecbuilder.com/

**DDC Online. Iowa Energy Center**
The Iowa Energy Center provides unbiased information on Direct Digital Controls. This site includes a guide to controls manufacturers and their products, an Introduction to Digital Control Systems, an Input/Output tutorial that also covers analog devices, and advanced technical information on DDC Systems.
http://www.ddc-online.org

**Energy Design Resources. HVAC Design**
EDR provides access to many useful tools and resources related to the design and operation of energy efficient buildings. The HVAC Design category includes design briefs, guidelines, and design software tools that cover a variety of efficient HVAC design techniques and technologies. Titles include *Design Guidelines for Chilled Water Plants* and *Chiller Plant Efficiency*.

**Heating/Piping/Air Conditioning (HPAC) Engineering**
HPAC articles under its BAS/Controls category cover a variety of topics on HVAC controls, networks, and building automation.
http://hpac.com/bas-controls/

**National Building Controls Information Program (NBCIP)**
NBCIP was established by the Iowa Energy Center and provides unbiased information on building control system products and strategies, including reports that describe the actual performance of products tested by the program. All publications on the site can be downloaded free of charge.
http://www.buildingcontrols.org

**Tool Lending Library at the Pacific Energy Center**
The Tool Lending Library (TLL) site contains images and descriptions for its data collecting devices from over 100 vendors. Application Notes describe measurement techniques and provide step-by-step instructions for using specific tools. The TLL has a search feature to help you select the right tools for your project. A tool request form and contact information is also provided.
http://www.pge.com/pec/tll/

**Commissioning**

**Building Commissioning Association (BCA)**
The Building Commissioning Association is a professional organization dedicated to “promoting building commissioning practices that maintain high professional standards”. Case studies, information about commissioning-related events, membership information, *Best Practices in Commissioning Exiting Buildings*, and other useful commissioning publications are available on this site.

**California Climate Data**
Heating and cooling degree days, bin data, and solar radiation data for several California locations are available in the PEC Energy Resource Center’s electronic catalog. Click on “Special Titles” under the Lists navigation bar.
http://207.67.203.54/P40007Staff/OPAC/index.asp
California Commissioning Collaborative
The California Commissioning Collaborative is a group of government, utility, and building service professionals organized to develop and promote commissioning practices in the California. The CCC site includes over 40 case studies, and a Library of information under its Resources heading that contains articles, white papers, guides, and sample commissioning documents.
http://www.cacx.org

Functional Testing and Design Guides
http://www.peci.org/ftguide/

Green California. Commissioning and Retro-Commissioning Buildings
California’s initiative for green buildings includes the commissioning and retrocommissioning process. This section describes the commissioning and retrocommissioning process and provides access to many useful guidelines, reports, and tools. Links to related Green California sites are also provided.
http://www.green.ca.gov/CommissioningGuidelines/default.htm

Portland Energy Conservation, Inc. (PECI)
PECI, a nonprofit energy efficiency consulting corporation, offers access to very good information on building commissioning topics. The Resource Library includes staff papers, presentations, best practices, case studies, procedural guidelines, and links to other related sites. PECI also offers information on training opportunities.
http://www.peci.org

Protocols

BACnet®
This official ASHRAE Web site provides the latest information on BACnet; vendors; a bibliography of articles, papers and books; ASHRAE SSPC 135 news; and related activities.
http://www.bacnet.org

BACnet® International
BACnet International promotes the use of BACnet in building automation and control systems. The site includes information about their testing laboratory and testing results.
http://www.bacnetinternational.org/

Echelon LonWorks®
The creators of the LonWorks® Systems solutions provide product descriptions, information about training opportunities, white papers, data sheets, manuals, and other technical documentation on their site. Guides for LonMark® are available in the documentation section of Support category.
http://www.echelon.com

LonMark® International
LonMark is an association of manufacturers and end-users that promote the interoperability of LonWorks based systems. This site includes product information, design guidelines, white papers, and certification information.
http://www.lonmark.org/

PG&E Resources:

Business Tools
PG&E Business Tools include Energy Usage, Billing History and Rate Comparison Tools.
http://www.pge.com/mybusiness/myaccount/analysis/
Demand Response Incentives
Information on the various Demand Response incentives offered by PG&E can be found here.
http://www.pge.com/mybusiness/energysavingsrebates/demandresponse/

Energy Use Audit Services. Energy Analyzer
Here are quick on-line tools for identifying and analyzing business energy use. Tools include a Do-It-Yourself Energy Audit.
http://www.pge.com/mybusiness/energysavingsrebates/analyzer/

Money-Back Solutions for your Business by Industry
Here you will find information about cash rebates and incentives for replacing existing equipment with new energy efficient technologies or purchasing new equipment. Design assistance for a new facility and system process is also available.
http://www.pge.com/mybusiness/energysavingsrebates/incentivesbyindustry/

Partners and Trade Professionals
PG&E program partners, local contractors and trade professionals offer special assistance in implementing energy efficiency measures for your business.
http://www.pge.com/mybusiness/energysavingsrebates/partnersandtradepros/

PG&E PowerPathway™
PowerPathway offers a Portfolio of programs aimed at building capacity within the state of California to produce the skilled workers needed by PG&E and the energy and utility industry. The PowerPathway Portfolio includes four separate but interconnected efforts: Career preparation, Industry workforce challenges, Education, and Green communities.
http://www.pge.com/about/careers/powerpathway/

Self-Generation Incentive Program at Pacific Gas and Electric
Financial incentive information, description of eligible technologies, forms, resources, and program contact information can all be accessed here.
http://www.pge.com/mybusiness/energysavingsrebates/selfgenerationincentive/

Print Resources Available in the PEC’s Resource Center:

- ACG Commissioning Guideline for Building Owners, Design Professionals and Commissioning Service Providers. AABC Commissioning Group, 2005
- ASHRAE Handbook on HVAC Applications. ASHRAE, 2011

Journals

- ASHRAE Journal
- Consulting-Specifying Engineer
Other Print Resources: