The CxEnergy Conference & Expo has everything you need to increase your knowledge and understanding of the broadening commissioning field. You don’t want to miss this super event!

www.CxEnergy.com
Join Us at CxENERGY 2018, April 23-26, Las Vegas, NV!

The #1 Commissioning and Energy Management Event

CxEnergy Technical Program: four concurrent tracks with a total of 32 AIA-approved presentations and case studies from industry experts across all building science disciplines.

Pre-conference offerings: certification opportunities in commissioning and energy management, plus a seminar devoted to testing and balancing topics.

Expo Hall: a wide range of products from controls, software, instruments, metering devices and services targeted specifically to commissioning, energy management, engineering and testing firms.

**PRE-CONFERENCE WORKSHOPS & CERTIFICATION OPPORTUNITIES**

**Commissioning Authority Workshop & Exam**

*Monday, April 23 – Tuesday, April 24*

8:00 am – 5:00 pm, $950

AMAZON E

This highly interactive workshop covers all aspects of commissioning and entails many group breakout activities where attendees will use project case studies to develop and discuss samples of key commissioning deliverables. The CxA exam is a 4-hour, closed-book exam that tests candidates on their knowledge of the commissioning process, as well as a general understanding of building systems and how commissioning fits in with the rest of the construction process.

**EMP Gap Session for Recertification**

*Tuesday, April 24*

2:00 pm – 3:30 pm, FREE

AMAZON I

This session followed by a short quiz fulfills an important ANSI recertification requirement for EMPs certified prior to April 2016 (EMP also have the option of retaking the EMP Examination to fulfill this requirement). The Gap Session covers subject matter that was not included or presented differently in the previous incarnation of the EMP Job Task Analysis (JTA) to bring it into alignment with the JTA stipulated by the DOE Better Buildings® Workforce Guidelines. The EMP Gap Session is offered free of charge, but preregistration is required.

**Energy Management Professional Seminar & Exam**

*Monday, April 23 – Tuesday, April 24*

8:00 am – 5:00 pm, $750

AMAZON C

The New EMP Seminar & Exam were developed to align with the new requirements for ANSI/DOE accreditation. The EMP program is a commissioning-based approach that maximizes energy savings and optimizes building performance. It also provides relevant information about existing building commissioning.

**CxA Gap Session for Recertification**

*Tuesday, April 24*

3:30 pm – 5:00 pm, FREE

AMAZON R

This session and short quiz, focused on existing building and ongoing commissioning, fulfills an important ANSI recertification requirement for CxA’s certified prior to April 2016 (the other option is to retake the CxA examination). The session is offered free of charge to ACG-certified individuals, however for planning purposes you must register in advance.

**Test & Balance Seminar for CxAs, Engineers, & TAB Professionals**

*Tuesday, April 24*

8:30 am – 2:30 pm, $250

AMAZON N

This series of in-depth, practical presentations include Flow Hood/K Factor, Kitchen Hood Testing, Smoke Control Verification, and Pharmacy/VSC Cabinets. These presentations are geared to helping commissioning providers, engineers, and test and balance professionals understand how key aspects of the test and balance process are carried out, why they are important, and what expected results should be. The TAB experts leading the sessions will emphasize how to apply AABC’s recently updated National Standards to challenges encountered in the field. Participants are invited to a reception on Monday, April 23 (5:00 pm - 6:30 pm) to enjoy complimentary cocktails and hors d’oeuvres as well as networking with AABC test & balance professionals.

**Welcome Reception in the Exhibit Hall**

*Tuesday, April 24, 5:00 pm – 6:30 pm*

Join us in the Exhibit Hall for the official opening of CxEnergy 2018. Enjoy complimentary cocktails and hors d’oeuvres and network with your colleagues while looking over the latest tools and technologies for commissioning, TAB and energy management.

Breakfast and lunch will be provided for all pre-conference workshops and seminars.
Wednesday, April 25

**Plenary Session**
8:00 am
Tropical Ballroom
Update on ANSI/DOE Accreditation for CxAs and EMPs

**Concurrent Technical Presentations**
10:00 am – 12:15 pm
Choose from one of four concurrent one-hour technical sessions led by experts on commissioning, TAB and energy management.

**Lunch in the Exhibit Hall**
12:15 pm

**Concurrent Technical Presentations**
2:00 pm – 5:30 pm

**Reception in the Exhibit Hall**
5:30 pm – 7:00 pm

Thursday, April 26

**Concurrent Technical Presentations**
8:00 am – 11:30 am

**Brown Bag Lunch & EMA Business Meeting**
11:30 am - 1:30 pm

**Continuing Education Credits**
CxEnergy technical presentations are approved for the following CEUs: AIA (LU/HSW), USGBC LEED General Education CE, CxA and EMP CE.

**PROGRAM AT A GLANCE**

### Monday, April 23
- 7:00 am
  - Registration for CxA Workshop
- 7:00 am
  - Registration for EMP Seminar
- 8:00 am – 5:00 pm
  - CxA Workshop
    (Breakfast & Lunch)
- 8:00 am – 5:00 pm
  - EMP Seminar
    (Breakfast & Lunch)
- 5:00 pm – 6:30 pm
  - AABC TAB Seminar Reception

### Tuesday, April 24
- 8:00 am – 5:00 pm
  - CxA Workshop & Exam
    (Breakfast & Lunch)
- 8:00 am – 5:00 pm
  - EMP Seminar & Exam
    (Breakfast & Lunch)
- 8:30 am – 2:30 pm
  - AABC Test & Balance Seminar
    (Breakfast & Lunch)
- 2:00 pm – 3:30 pm
  - EMP Gap Session
    (FREE)
- 3:30 pm – 5:00 pm
  - CxA Gap Session
    (FREE for ACG Members)
- 5:00 pm – 6:30 pm
  - Welcome Reception in Exhibit Hall

### Wednesday, April 25
- 7:00 am – 6:00 pm
  - Registration
- 7:00 am – 8:00 am
  - Breakfast
- 8:00 am – 8:45 am
  - Opening Plenary Session
- 8:45 am – 9:45 am
  - Meet & Greet in Exhibit Hall
- 10:00 am – 12:15 pm
  - Concurrent Technical Sessions
- 12:15 pm – 2:00 pm
  - Lunch in the Exhibit Hall
- 2:00 pm – 5:30 pm
  - Concurrent Technical Sessions
- 5:30 pm – 7:00 pm
  - Grand Reception in Exhibit Hall

### Thursday, April 26
- 7:00 am – 8:00 am
  - Breakfast
- 8:00 am – 11:30 am
  - Concurrent Technical Sessions
- 11:30 am – 1:30 pm
  - Brown Bag Lunch & EMA Business Meeting

**PRESENTED BY**

[Images of logos for AABC, ACQ, and EMA]
CxENERGY PROGRAM
WEDNESDAY, APRIL 25, 2018

7:00 am - 6:00 pm  Registration  8:00 am - 8:45 am  Opening Plenary Session
7:00 am - 8:00 am  Breakfast  8:45 am - 9:45 am  Meet & Greet in Exhibit Hall

10:00 am - 11:00 am

**Case Study: Cx of South Airport APM/ITM Complex at Orlando International Airport**
Bob Knoedler, PE, CxA, EMP, Hanson Professional Services Inc.
James Hackenberg, PE, LEED AP, Greater Orlando Aviation Authority

When the new South Airport Automated People Mover / Intermodal Transportation Facility Complex (SAC) at Orlando International Airport was commissioned, the massive project produced invaluable lessons and best practices in coordination. Commissioned systems include all major building envelope, mechanical (HVAC), plumbing, electrical and life safety systems. The session provides a real world example of how to approach the Cx of a $650 million project with multiple contractors and stakeholders.

**Strategies for Reducing Energy in the Built Environment at Caesars Entertainment**
Rob Morris, PE, Caesars Entertainment

Energy management in the built environment is an important matter not only for occupant comfort and cost reduction, but also as a strategy to minimize upstream greenhouse gas emissions and impacts on global climate change. This presentation highlights an approach used by Caesars Entertainment to target energy efficiency opportunities at an enterprise level. A specific area of focus will be on retro-commissioning of major heating, ventilation and air conditioning systems.

11:15 am - 12:15 pm

**Forthcoming Standard 211P Update**
Jim Kelsey, PE, LEED AP, kW Engineering
Chairman ASHRAE 211P Committee

Standard 211P defines the procedures required to perform ASHRAE Level 1, 2, and 3 energy audits, provides a common scope of work for those audit levels and best practices for use by building owners and others, and establishes standardized industry practices and minimum reporting requirements for results.

**Lab Retro-Cx: The Rebirth of a Research Facility**
Rob Clegg, PE, RMF Engineering
Travis Campbell, CxA, RMF Engineering

Science and research changes constantly. Laboratory needs change and each change can dramatically affect the operation of adjacent labs. However, adjacent labs are rarely tested to confirm correct operation. Changes including additions such as new fume hoods can overburden the exhaust system, resulting in code or health issues. As laboratories age, they become problematic. Sensors fall out of calibration, control devices fail and become outdated. Laboratories must be regularly tested to weed out and repair these issues. A small percentage of devices out of calibration can tip the entire system into a state where it doesn't meet basic requirements, much less code requirements.

**Testing HVAC Water Systems with Diversity**
Jim Hall, PE, TBE, CxA, Systems Management & Balancing, Inc.

There are several types of HVAC water systems that are designed with diversity, it could be a chilled water system, heat pump loop water system, heating system or most commonly a reheat water system. When diversity exists in an HVAC water system, the testing, adjusting, and balancing (TAB) of this system requires a system review and careful consideration of the approach to the TAB process. This presentation examines the appropriate TAB approaches to HVAC water system diversity and various testing scenarios.

**Microgrids-as-a-Service: A New Approach to Solve Today's Energy Challenges**
Mark Feasel, Schneider Electric

This session discusses how municipal, district, institutional, commercial campus or large buildings can benefit from a “Microgrid-as-a-Service” business model to stabilize long-term energy costs and upgrade critical energy infrastructure without upfront capital. The session showcases the "MaaS" model with recent projects with the Montgomery County, MD, Public Safety Headquarters and Correctional Facility as examples. The session examines specific energy challenges faced by this facility, commissioning processes undertaken to deploy the microgrid and benefits achieved.

**Top Operational and Energy Saving Trends for Data Center Cooling**
Brad Nacke, United Technologies Corporation

Data center operators historically focused on IT infrastructure and management systems to lower CAPEX and OPEX while meeting SLAs for scalability and time-to-market. Operators are now turning to critical infrastructure technologies to potentially extend these gains further. This presentation will highlight the advances made in critical infrastructure technologies for chillers and cooling plants, AHUs, and modular approaches to achieve significant operating and energy expense savings.

**Understanding New Air Flow Regulations and ASHRAE Air Flow Requirements and Solutions**
Ray Prosise, ONICON

The important part of any HVAC commissioning or re-commissioning for new construction, renovation or energy modernization is the balance of the air flow systems for proper minimum air flow, IAQ and pressurization. Balancing of the air flow system can be cumbersome for the TAB team and time-consuming with the types of air systems and various technologies applied to these systems. This presentation explains new changes in regulations and ASHRAE updates affecting air flow requirements in the HVAC systems and how energy conservation measures affect them.
Drones & Thermal Imaging for Building Envelope Review
John Harnage, Kentucky Thermal Institute

Drones are becoming the preference for quick and dependable method of inspections. They offer both an exceptional perspective and an unparalleled point of view at a fraction of the labor cost. The increased use of thermal imaging technology and the affordability of drone-mounted thermal imagers will play a large role in shaping the future forensic drone inspections. This new method will change the future of how engineers and architects complete their final designs. Education will be the key to remaining on the front edge of this technology to increase your firm’s knowledge to ensure they truly understand how to design a building of the future.

Tunable White Lighting — Minimize Risk During Commissioning and Satisfy Your Client
Eric Lind, Lutron Electronics Co., Inc.

LEDs have provided many new lighting capabilities, but with that have come some challenges. This presentation will discuss how to successfully implement Tunable White lighting on a project, with a brief overview of the technology and the key applications. One such application being tunable white lighting as part of a WELL building. This presentation will educate the audience on the user interfaces needed to make immediate changes and verifications to a lighting control system in order to meet WELL building requirements. It also covers commissioning requirements.

Electrification of Building Energy Supply for Superior Economics & Sustainability
Joseph Stagner, PE, Stanford University

Electrification of building heating and cooling processes, coupled with clean electricity supply, is the predominant path forward to sustainable and economic building energy supply for the long term. This presentation will explain the Stanford Energy System Innovations (SESI) project and the additional enhancements Stanford is studying to complete its full transformation to an affordable and sustainable energy system in less than 10 years.

Fundamentals of Test & Balance for Engineers, Cx & Energy Providers
Brian Venn, TBE, CxA, Mechanical Testing, Inc.

This practical, information-packed session explains many of the key test and balance issues—from precise specifications, to duct leakage testing, to pump- and fan-curve considerations—that if properly addressed in cooperation with an independent TAB firm can ensure that any project goes smoothly.

Leading without Authority: Engaging the Project Team
Jim Magee, CxA, EMP, LEED AP, Facility Commissioning Group

Massive complexities associated with modern building construction projects lead to increasing interdependence of trades and professions to achieve success through collaboration. Project commissioning epitomizes this need for teamwork coupled with consistent process application. This presentation explores collaborative techniques and is open to interaction and sharing of additional ideas and methods.

Benchmarking Made Easy with DOE's and EPA's BenchmarkMyBuilding
Josh Wentz, Lucid

The free BenchmarkMyBuilding service draws data from DOE’s Building Performance Database (BPD) and EPA's ENERGY STAR Target Finder to present statistically meaningful benchmarks. This sessions provides service providers and building owners a tutorial on to quickly engage with this valuable energy benchmark data. Attendees will also learn how, through energy benchmarking, an organization can establish energy reduction targets, identify savings opportunities and stay on budget throughout the year.

The Basics of NFPA 92, Standard for Smoke Control Systems, and Changes to Anticipate in 2018
Kelly Kidwell, PE, Jensen Hughes

NFPA 92 applies to the design, installation, acceptance testing, operation, and ongoing periodic testing of smoke control systems. As the industry standard, it is important for designers, installers, and code enforcers to be familiar with the document, its history, and remain abreast of upcoming changes.

Catch and Don’t Release: Capturing and Maintaining the Value of Data from Commissioning to Operations
Joshua Gepner, PE, Environmental Systems Design, Inc.

This presentation will explain how to set up successful documentation and data collection strategies during the commissioning process, how accurate commissioning records provide the knowledge base needed for maintaining a building, as well as strategies for providing commissioning data for use during operations and occupancy.
Case Studies on the Effective Use of Energy Analytics

Claire Curtin, Lawrence Berkeley National Laboratory

As digital controls and smart meters become commonplace in commercial buildings, facility teams have access to overwhelming amounts of data. This data does not typically lead to insights and corrective actions unless it is analyzed and prioritized in automated ways. Analytic software and diagnostic tools usage are increasing to help uncover hidden operational opportunities, which is enticing for decision makers looking for short paybacks.

A NFPA 70B & 70E Overview: Eliminate the Risk of Electrical Hazards & Avoid Expensive Shutdowns

Bhanu Srilla, Grace Engineered Products, Inc.

Facility shutdowns due to electrical equipment failures and catastrophic accidents due to improper maintenance cost organizations millions. This session focuses on the importance of electrical safety and maintenance programs, OSHA requirements and definitions for CFRs 1910.147 & 303 and 305, guidance of NFPA 70E and 70B standards on electrical safety and recommended practice for electrical equipment maintenance. Topics include risk control hierarchy, methods to eliminate or mitigate risk using safety-by-design controls, technologies and trends in predictive maintenance tools and remote monitoring tools.

Citi Expands the Market for Energy Efficiency

Bruce Schlein, Citi
Bob Hinkle, Metrus Energy, Inc.

A 2009 McKinsey & Company report cited a potential $520 billion marketplace to retrofit building systems such as lighting, HVAC and windows. Problem is, this order of magnitude requires capital-market and institutional investor participation. This presentation examines “efficiency as a service” a flexible, market-proven solution that turns kilowatts into “negawatts” (units of saved energy) by financing 100% of the project cost and monetizing the energy savings. This presentation examines a real life example of this financing method and demonstrates its vast potential to the energy retrofit marketplace.

Cover your BAS: Simple Steps to Address Cybersecurity Concerns in Your Building Automation Systems

Pook-Ping Yao, Optigo Networks

BACnet systems are shockingly vulnerable. Are yours secure? Ever thought about what an intruder could access if they unplugged a smart device and connected to the network with a laptop? Only six million commercial buildings in the US are believed to be unsecure. They have exposed building controllers, security cameras and access control systems that an entry level hacker could hack. This presentation covers common vulnerabilities in BACnet systems and provides common sense approaches to ensure your Building Automation System deployments don’t leave a building open to attack.

Demand Response. Best Practices for Multi-Division, Multi-site Program Implementation

Kevin Hamilton, NuEnergen

Years of research have focused on the benefits and challenges demand response implementation has on single buildings and building owners. But little attention has been given to the benefits and best practices for multi-site, large-scale government agencies to participate in demand response programs. Fortunately, more multi-site operators with large-scale demand response implementation have emerged. They showcase that the benefits of demand response programs now extended to larger, more specialized infrastructure. This presentation cites the demand response program administered by New York City which provided up to 75MW of grid relief annually and earned revenue over $22 Million.
Decommissioning: What You Need to Know in the Absence of Standards

Rogeh Alnajjar, PhD, PE, CxA, Alpha Commissioning Engineers Inc.
Mina Alnajjar, LEED AP, Alpha Commissioning Engineers Inc.

Decommissioning has been around as long as commissioning, yet not many engineers know about the benefits we can obtain and the risks we can avoid through this practice. This case study investigates the exterior and interior of a school, as well as planning, documentation, and training. The completed project transformed a non-performing investment into a system that exceeded expectations.

Integrate Operational Readiness Services with Building Commissioning

Jason McGehee, CxA, CEM, LEED AP, Argo Performance, Ltd.

In the period between construction and operational readiness, there’s an opportunity for Cx firms to integrate new services that assist the new operators. This session provides attendees methods and techniques for integrating operational readiness services into existing Cx offerings. Operational readiness services include: creating lockout-tag out programs, writing and testing standard operating procedures, developing maintenance management systems, writing safety protocols, asset induction, configuring facility documentation management systems, creating calibration management programs, and identification and procurement of critical parts, and consumables. These services can be generated during the construction phase and implemented in the acceptance phase. This integrated offering enhances the revenue stream and elevates the role of Cx.

How is Energy Resiliency Dependent Upon Commissioning?

J. Woody Thompson, PE, CxA, CEM, LEED AP, RS&H

The need for energy resilience at the facility level was illustrated by the devastating hurricanes that affected the Texas Gulf Coast, Houston, Florida, Puerto Rico, and multiple earthquakes in Mexico. Existing Building Commissioning is one method to determine facility energy resiliency. Ensuring that facility systems maintain reliability and support energy resiliency is the ultimate focus and goal of successful Existing Building Commissioning (EBCx). This presentation will convey the importance and dependence of facility Cx/EBCx as a critical, if not the most important aspect, of energy resiliency.

Incorporating Distributed Energy Generation Projects into Whole Building Commissioning

Thomas D. Prevish, PhD, PE, NorthWest Engineering Service, Inc.
Jon McLaren, CxA, NorthWest Engineering Service, Inc.

Distributed energy and power systems, including the integration of renewable energy generation sources, cogeneration, energy storage systems and traditional backup generators, are increasing in importance, due to both decreasing costs and a renewed emphasis on resiliency and community microgrids. This presentation discusses how Owner’s Project Requirements and commissioning plans can be expanded to incorporate Distributed Energy Systems.

Monitor Based Approach

Greg Schlegel, PE, CxA, LEED AP, ETC Group
Sarah Boll, State of Utah

The University of Utah implemented a laboratory controls upgrade at the Henry Eyring Chemistry Building inspired by the U.S. Department of Energy’s Better Building Challenge. This case study outlines how the monitoring system was set up and utilized throughout the process. The owner’s perspective focuses on the process of resolving issues to establish a safe laboratory environment and gain energy savings.

Greener Building Plan

Holly Savoia, Director of Sustainability for NYC LL87/09

Five years ago, New York City enacted a law mandating that buildings over 50,000 gross square feet undergo periodic energy audit and retro-commissioning measures. NYC is a pioneer in implementing an energy audit and RCx statute on this scale that also features punitive measures for building owners in non-compliance. This session examines data produced since implementation, including lessons learned, efficiencies gained and a look into the City’s more ambitious goals.

Owner and Engineer’s Success with a Monitor Based Approach

Jane Guyer, PE, ETC Group
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Case Study: Re-Commissioning an Industrial Gas Chiller

Melissa Bynum, North Slope Borough, Department of Capital Improvement Program Management
Walter Heins, PE, CxA, Coffman Engineers, Inc.

This case study examines re-starting, re-commissioning, and optimizing an industrial gas chiller used for drying well-head natural gas. It validates building commissioning processes in non-building applications. The project applies building commissioning to a piece of industrial equipment. The re-commissioning led to a new OPR, an operational hazard analysis, design review, installation verification, and testing as well as planning, documentation, and training. The completed project transformed a non-performing investment into a system that exceeded expectations.

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- **APPROXIMATELY** **31%** average time savings*

*Actual results may vary per project*
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AABC members are sworn to uphold the highest standards in the industry and are trained and certified in all areas of environmental testing and analysis. Engineers specify AABC to ensure that work is performed by an independent agency.

For more information about AABC programs, to find out how to specify AABC, or to locate AABC members, visit www.aabc.com

AABC Publications: The Best Resources for Testing & Balancing

AABC Publications are the most highly regarded in the industry.

Now ANSI-approved, the 7th Edition of the AABC National Standards details the minimum standards for Total System Balance.

The newly revised and expanded Technician Training Manual provides comprehensive instruction to aid in the training of test and balance technicians.

For more information and to view other AABC publications, visit aabc.com/publications

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To reserve your space, fill out the registration form above and drop it off at the Registration Desk before you leave the event or email it to ACG Headquarters at info@commissioning.org