

CONFERENCE PROGRAM

Cx ENERGY 2018

CONFERENCE & EXPO

APRIL 23-26, 2018

RIO ALL-SUITE HOTEL ■ LAS VEGAS, NV



COMMISSIONING | ENERGY MANAGEMENT | BUILDING TECHNOLOGY

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!

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RIO ALL-SUITE LAS VEGAS HOTEL

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

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.



CxA Gap Session for Recertification

Tuesday, April 24

3:30 pm – 5:00 pm, FREE

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.



Energy Management Professional Seminar & Exam

Monday, April 23 – Tuesday, April 24

8:00 am – 5:00 pm, \$750

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.



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

Tuesday, April 24

8:30 am – 2:30 pm, \$250

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 network with AABC test & balance professionals.



EMP Gap Session for Recertification

Tuesday, April 24

2:00 pm – 3:30 pm, FREE

This session followed by a short quiz fulfills an important ANSI recertification requirement for EMPs certified prior to April 2017 (*EMPs 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.

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

Update on ANSI/DOE Accreditation for CxAs

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 will be 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



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.

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 water 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.

11:15 am - 12:15 pm

Forthcoming Standard 211 P 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 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.

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 Prorise, 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 various 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.

12:15 pm - 1:45 pm

Lunch in Exhibit Hall

2:00 pm - 3:00 pm

Drones in AEC and Commissioning: An Introduction

Gigi Inguva, Measure, the Drone as a Service Company

In this session we will explore the intersection between drone usage and commissioning workflows primarily for built assets. Measure, the drone-as-a-service company will present pragmatic AEC use cases of drones while helping the audience distinguish between the hype and reality of this disruptive technology. We will also touch upon the drone hardware/software and services marketplace and organizational considerations for implementing drone technologies.

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.

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 session 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.

3:15 pm - 4:15 pm

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.

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 accurate commissioning records provide the knowledge base for maintaining a building and what important record keeping is required to keep the building healthy.

4:30 pm - 5:30 pm

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.

With Great (Emergency) Power Comes Great Responsibility: Cx of Hospital Emergency Power Systems

Mark Gelfo, PE, LEED Fellow, CxA, EMP,
TLC Engineering for Architecture

Like Spider-Man, the Commissioning Authority tries to stop disaster before it happens. But their importance is often not understood or appreciated until too late, especially concerning commissioning Emergency Power Systems. Healthcare facilities may be able to deal with a temporary loss of utility power, but not a failure of the emergency power systems. This session explains why and how our superhero Cx Agent leads the Cx Team to ensure emergency power systems are fully reliable to protect the health and safety of patients, staff and visitors.

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

Kevin Hamilton, NuEnerg

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.

5:30 pm - 7:00 pm

Reception in Exhibit Hall

THURSDAY, APRIL 26, 2018

7:00 am - 8:00 am

Breakfast

8:00 am - 9:00 am

The Evolution of Commissioning at the University of Texas at Austin

Adam Keeling, PE, University of Texas
John Bixler, PE, LEED AP, NV5
Alex Gonzales, PE, CxA, LEED AP, NV5

An examination of the needs of an institutional client, and the gap left by the traditional new building commissioning process. The University of Texas has been working to transform the requirements of their Commissioning Providers to more robustly support their building operations and optimization while continuing to deliver quality construction projects. Changes include more involvement in the turnover process, a stronger focus on the warranty period, and bringing additional expertise to the table.

Case Study Using a Variable Flow Chiller in a Central Plant

Gaylon Richardson, TBE, CxA, Engineered Air Balance Co., Inc.

This case study covers a central plant serving chilled water to Air Handling Units in the central plant, a medical office building, and a hospital. This presentation will cover an overview of the system operation with three 1250 ton chillers and an overview of the bypass system and how to size bypass valves. Attendees will learn why the owner and engineer wanted to add a temporary chiller.

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, facilities 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.

9:15 am - 10:15 am

How is Your 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 resilience. 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. Previsch, 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.

NYC's Audit & RCx Statute, a Greater, 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
Greg Schlegel, PE, CxA, LEED AP, ETC Group
Sarah Ball, 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.

10:30 am - 11:30 am

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, identifying risks and findings with over 10 hazardous material categories that will help engineers create a more ideal demolition. This study will include all aspects of making sure an efficient decommissioning process is performed. Finally, this presentation will create a template for engineers to use in practice since decommissioning does not have universal guidelines set by any national associations.

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.

Integrate Operational Readiness Services with Building Commissioning

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

In the period of time between general contractor turn over and operational readiness, there is an opportunity for commissioning firms to integrate new commissioning services that will assist the new operators with this transition. Attendees will learn methods and techniques integrating operational readiness services into their existing commissioning service offerings and implementing them during the commissioning process. By utilizing the time between design release and building start up, the commissioning professional can lead the effort to prepare and even commission these services. The integrated offering will not only enhance a firm's revenue stream but elevate the key role and capabilities of the commissioning industry.

Driving to Outcomes: How Evolving Energy Performance Policies Impact the Building Process

Ryan Colker, J.D., National Institute of Building Sciences

Communities are establishing energy performance and/or greenhouse gas emission goals. This requires a new approach to building codes and other policies. One approach is increasing focus on project outcomes for new construction and renovations. Outcomes rely on actual results rather than design and construction-based criteria which may not result in achieving goals. This session examines current and proposed outcome-based code provisions (including recent guidance from the NIBS) and how Cx providers and others focused on energy performance can assist building owners in achieving goals.

11:30 am - 12:30 pm

Brown Bag Lunch & Roundtable Discussions

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