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CxENERGY 2022

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APRIL 19-22, 2022 | ORLANDO, FLORIDA
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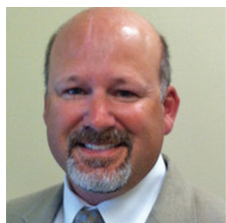
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Join Us at CxENERGY 2022!

PRESIDENT'S WELCOME



Troy Byers, PE, CxA
Byers LLC
ACG President

Dear Colleagues:

On behalf of ACG, EMA and AABC, I am thrilled to welcome you back to **CxEnergy**! Our three organizations and our members have been busier than ever over the past few challenging years, so this is a great time to meet with your colleagues and share what we've collectively learned. Many thanks to our members, sponsors, speakers and exhibitors who help make this the premier industry event

for commissioning, energy management and testing professionals. We're so glad you joined us, and I hope you enjoy **CxEnergy 2022**!

Sincerely,

Troy Byers, PE, CxA
Byers LLC
ACG President

PROGRAM AT A GLANCE

TIME	TUESDAY, APRIL 19	WEDNESDAY, APRIL 20
7:00 am - 8:00 am	Registration for CxA Workshop & EMP Seminar	
8:00 am - 5:00 pm	Commissioning Authority (CxA) Workshop & Exam	
8:00 am - 5:00 pm	Energy Management Professional (EMP) Seminar & Exam	
8:00 am - 4:00 pm		TAB & Cx Seminar
11:00 am - 5:00 pm		CxEnergy Open Golf Tournament
5:00 pm - 7:00 pm		Welcome Reception in the Expo Hall

TIME	THURSDAY, APRIL 21	FRIDAY, APRIL 22
7:00 am - 8:00 am	Registration & Breakfast	
8:00 am - 8:45 am	Opening Plenary Session	8:00 am - 11:30 am Concurrent Tech Presentations
8:45 am - 9:45 am	"Meet & Greet" with Sponsors & Exhibitors	11:30 am - 12:30 pm Brown Bag Lunch
10:00 am - 12:15 pm	Concurrent Technical Presentations	 Breakfast and lunch will be provided for all pre-conference workshops and seminars.
12:15 pm - 1:45 pm	Lunch in the Expo Hall	
2:00 pm - 5:30 pm	Concurrent Technical Presentations	
5:30 pm - 7:00 pm	Reception in the Expo Hall	



CxENERGY OPEN Golf Tournament



Sponsored by the Energy Management Association
Wednesday, April 20

10:00 a.m. (meet in the hotel lobby) • \$165 (individual)

The Energy Management Association cordially invites you to join us for an exciting day at the CxEnergy Open at Disney's Lake Buena Vista Golf Course on **Wednesday, April 20**. Contact Jen Billingslea at meetings@energymgmt.org.



COVID-19 Notice

ACG takes COVID-19 seriously and is committed to the safety and well-being of every conference attendee. The in-person event will be in accordance with CDC protocols and state and local regulations. ACG is working closely with the hotel to promote healthy behaviors that reduce the spread of the virus, such as mask wearing, social distancing, and increased number of sanitation stations. Please check CxEnergy.com for frequent updates.

PRE-CONFERENCE EDUCATIONAL & CERTIFICATION OPPORTUNITIES



Commissioning Authority Workshop & Exam

Tuesday, April 19 – Wednesday, April 20

8:00 am – 5:00 pm, \$950

This highly interactive workshop covers both new and existing building commissioning, and includes many group breakout activities where attendees will use project case studies to develop and discuss samples of key commissioning deliverables. The 4-hour, closed-book CxA exam is offered at the end of the second day to prequalified candidates.



Energy Management Professional Seminar & Exam

Tuesday, April 19 – Wednesday, April 20

8:00 am – 5:00 pm, \$950

This one-and-a-half day course explains an approach to energy management that maximizes energy savings and optimizes building performance. Attendees can expect a classroom-style discussion of EMA's commissioning-based energy management process, and the opportunity to directly work with instructors on essential techniques and calculations. On the final day, the EMP exam will be administered to approved candidates.



TAB & Cx Seminar

Wednesday, April 20

8:00 am – 4:00 pm, \$250

Earn up to
5 AIA LU

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Continuing
Education
Provider

These in-depth, practical presentations will help Cx providers, engineers, and TAB professionals understand key interfaces between test and balance and commissioning on both the process and project level, and how close coordination drives better results.

System Airflow Leakage and Deflection Testing



Gaylon Richardson

TBE, CxA
Engineered Air Balance Co., Inc.

The Benefits of Pressure Independent Valves in HVAC Systems



Stephen Rybka

Belimo

Airflow Measurement & Control with Induction Diffuser Technology



V. Todd Yates

PE, TBE
Synergy Test & Balance

Distributed Pumping in Chilled Water Systems



L. Peter Korzeniewski

LEED AP
Grundfos – Commercial Building Services

Healthcare Facility Compliance: Best Practices for an Independent, AABC Total System Balance Approach



Brian Venn

TBE, CxA,
Mechanical
Testing, Inc.



Jeremy Johnson

TBE, CxA,
American
Testing, Inc.



Cody Shook

TBE, CxA,
Precision Flow
Engineering

To register, visit www.CxEnergy.com. Use promo code **TAB10** for a **10% Discount** at checkout.

Learn more: <https://www.aabc.com/tab-and-commissioning-seminar>



Welcome Reception in the Exhibit Hall

Wednesday, April 20

5:00 pm – 7:00 pm

Enjoy complimentary cocktails and hors d'oeuvres, and network with your colleagues while interacting with the latest tools and technologies for commissioning, TAB, and energy management.

GRAND SIERRA F & G

ACG Building Systems Commissioning Guideline Preview

Jim Magee, CxA, EMP, Facility Commissioning Group
Daniel Bailey, Independent Consultant

10:00 a.m. -
11:00 a.m.

The new ACG Building Systems Commissioning Guideline is here, with a new focus on best practice narratives on a wide variety of topics. These practical guides will offer insight and strategies on a variety of topics, from system-specific Cx guidance, to managing processes and directing resources, producing Cx deliverables and much more! The new digital resource—intended to be updated and expanded frequently—is designed to help providers get commissioning done in the real world.

\$1.2T Infrastructure Investment & Jobs Act (IIJA) – Opportunities for Commissioning Agents 2022-2026

Craig R. Sieben, AECOM

11:00 a.m. -
12:00 p.m.

The IIJA represents a huge prospective investment in our nation's critical infrastructure, from roads, bridges, trains, buildings, broadband, the electric grid and more. Commissioning Agents represent a critical discipline who can help confirm that dollars spent are spent well. What is the role commissioning will play as the dollars start to roll out in FY22 and beyond?

12:15 p.m. - 1:45 p.m. Lunch In Expo Hall - Grand Sierra E

Commissioning A Prison Complex: Overview, Technology, and Lessons Learned

Greg Schlegel, PE, CxA, LEED AP, Bernhard
David Meyers, AIA, LEED AP BD+C, Burns & McDonnell

2:00 p.m. -
3:15 p.m.

Prisons are one of the most complex facility types to design, construct, and operate. This case study will discuss commissioning the new 40-building, 130-acre Utah State Correctional Facility. Noteworthy aspects of the project included indirect-direct evaporative cooling with a centralized cooling water plant, completely isolated IT networks, individual building sub metering and energy monitoring, carbon reporting, and fault detection and diagnostics (FDD).

Don't Forget the Fuel! 10 Things to Look for when Commissioning Generator Fuel Systems

Mark Gelfo, PE, CxA, EMP, LEED Fellow
TLC Engineering Solutions

3:15 p.m. -
4:15 p.m.

All emergency power systems have one thing in common, regardless of size, location, or type of facility: they run on fuel. And the number one reason emergency power systems fail or fail to start? Fuel. Despite being absolutely essential to the reliable start-up, operation, and performance of on-site power generation, fuel systems are often underappreciated, improperly designed, and misunderstood. This session will discuss common issues (and best practices) from commissioning emergency power systems, across all project phases, as told through real world case study examples.

CURACAO 1, 2, 3 & 4

From Commitment to Completion - Promises Made/Promises Kept an Energy Case Study

Al LaPera, CxA, EMP, TLC Engineering Solutions

This case study presentation will analyze a single-owner, 250,000 sq. ft. office building, showing the project's progress from the initial energy audit findings and predicted energy savings to today's energy footprint. The session will look at the project from both the design team and the owner's perspectives through the entire process: audit, decisions made, and implementation through measurement and verification and will display, where applicable, audit predictions and their actual outcome.

Comparison: NETA Standard for Electrical Commissioning and ACG Guideline

Moderator: Jesse Felter, SSRcx, ACG Cx Guideline Committee
Mark Gelfo, PE, CxA, EMP, LEED Fellow TLC Engineering Solutions
Peter Turek, CxA, EMP, LEED AP O & M TLC Engineering Solutions
Charles Jackson III, PE, PMP, CxA, CEM, Sustainable Building Partners
Dick Dutro, CxA, BCxP, CPD, LEED AP BD+C, Total Systems Commissioning, Inc.

Owners must navigate an industry without seemingly clear direction with electrical commissioning criteria. It can be argued that resources used for commissioning of electrical equipment and systems would better serve the owner if providing a systematic process, repeatable for a range of project scope and needs. This comparative study is intended to contrast similarities and difference with guidelines and standards for possible electrical commissioning practices.

Overcoming Challenges with Core and Shell Commissioning

Adam Herzer, BCxP, CEM, CxA, LEED AP
Baumann Consulting

In the commercial sector developers build the shell of building with all required HVAC for the future of the building once they gain tenants that outfit their internal space. This presents challenges including performance impacts when tenants change, fit-out scheduling problems, and reduced equipment lifespans. This session will discuss core and shell and tenant fit out case studies, lessons learned and strategies to overcome challenges.

Whirlwind Recovery: Commissioning an Industrial Campus Rebuild Post-Tornado

Lincoln Pearce, PE, LEED AP, IMEG Corp.
Pablo Benitez, PE, CxA, IMEG Corp.
Heath Van Gorp, Vermeer

A devastating EF3 tornado hit Vermeer Corporation's campus in 2018, completely destroying several plants and damaging several other buildings that totaled 400,000 sq. ft. of manufacturing space. This session will cover the commissioning for the construction of a 500,000 sq. ft. Plant 7, a 35,000 sq. ft. Eco Center, and a 4,500-ton campus chilled water plant as part of the successful rebuild and recovery.

8:45 a.m. - 9:45 a.m. Meet & Greet with Sponsors & Exhibitors - Grand Sierra D & E

GRAND SIERRA H & I

Fundamentals of Test, Adjust, & Balance for Engineers, Cx & Energy Providers

Jim Hall, PE, TBE, CxA

Systems Management & Balancing, Inc.

10:00 a.m. -
11:00 a.m.

This practical, information-packed session explains many of the key test and balance challenges—from practical system design considerations, to the TAB process, to obtaining meaningful and useful data—that if properly addressed in cooperation with an independent TAB firm can ensure that any project goes smoothly.

Case Study: Testing, Adjusting, and Balancing a Hyperscale Data Center

Paul Lewis, EIT, Engineered Air Balance Co. Inc

11:00 a.m. -
12:00 p.m.

This session will examine the testing and balancing of a 2.5 million sq. ft. campus in Fort Worth, Texas, consisting of six buildings housing 22 data halls, with an enormous fan array air delivery system of 144 fans delivering nearly 1.3 million total CFM in each hall. In addition to information on measurement and testing procedures, the presentation will discuss how TAB and Cx can best work together during Data Center L3 and L4 Commissioning.

Controls Contractor: TAB and Cx Friend or Foe?

Justin Garner, PE, TBE, CxA, Engineered Air Balance Co., Inc.

2:00 p.m. -
3:15 p.m.

Mechanical HVAC systems are the most frequently commissioned systems in part because they are often the most complex from a sequencing and control standpoint. Controls contractors are frequently blamed for delaying the commissioning process—this seminar will look at a project from their perspective to highlight the challenges they face, and to reveal strategies for the TAB firm and Cx Provider to create a working relationship with the controls contractor.

As The Pages Turn: Advances in Building Automation and Control Technologies

David Guberud, CxA & Rachel Rueckert, PE, QCxP, CxA, LEED AP, Ring & DuChateau LLP

3:15 p.m. -
4:15 p.m.

The best way to verify that everyone understands the project control submittal with its sequences and the interdependencies the same way is a controls page turn meeting. This two-part session will first clarify who should attend, and how to properly prepare and efficiently run this meeting, and then perform an 'on the spot' interactive page turn, with attendees role-playing different members of the construction team while reviewing actual control submittals.

CURACAO 5, 6, 7 & 8

Integrating Meter Data, Equipment and Tariff Rates for ECM Identification, Assessment and Verification

John Petze, SkyFoundry

Combining interval meter data with tariff rate structures and other data provides deep insights into the viability and financial benefits of potential ECMs. Specially designed software tools enable analyses with far less effort and lower cost than manual analysis efforts. This presentation will highlight specific examples showing how these data can provide clear understanding of interrelationships, correlations and cost impacts.

Sample No More – How Automated Functional Testing Enables 100% Testing

Derek McGarry, PE, LEED AP, OTTO

Per IFMA, most post-occupancy issues associated with zone-level devices are random, not systemic. This is a problem when so many commissioning projects make use of sampling for functional testing. This session will explain how Cx providers can use automated functional testing to easily extend to all zones, lowering costs and delivering better results, using specific examples from a variety of projects.

Tomorrow's Commissioning, Beyond MEP

John Runkle, PE, Intertek

Stephen Shanks, CxA, BECxP, NDT Level III, Intertek

In a new era refocused on IAQ, secondary systems beyond MEP and controls and evolving practices such as Building Enclosure Commissioning will play an increasing role in delivering healthy air. However some of these goals conflict with each other, as techniques to improve IAQ often increase energy usage. Modular construction is seen as a potential solution, but the buildings must still be commissioned—requiring modified Cx practices to accommodate off site construction.

Real-Time IAQ Data for Managing Key HVAC System Infrastructures

Julien Stamatakis, Senseware, Inc.

Real-time IAQ monitoring with public-facing cloud dashboards are gaining acceptance as a standard expectation of building owners and operators, for reasons of both corporate governance and operational efficiency. This session will examine case studies—one on real-time particulate matter monitoring such as from wildfires, the other covering real-time ion data for bipolar ionization systems—that demonstrate the day-to-day utility of leveraging real-time IAQ data.

12:15 p.m. - 1:45 p.m. Lunch In Expo Hall - Grand Sierra E

Light it Up: Lighting Controls Continue to Adapt and Improve

Charles Jackson III, PE, PMP, CxA, CEM
Sustainable Building Partners

Lighting typically offers the best opportunity to improve your energy efficiency with the lowest implementation cost. Therefore reviewing and testing the lighting control system—whether a simple single-pole wall switch or integration with the time of day, dimming, occupancy, HVAC, and load shedding—is high on the Cx priority list. This session will cover lighting control evolution, current Cx process, conflicting strategies, and common mistakes.

4:30 p.m. –
5:30 p.m.

Efficiency, Sustainability, Resiliency and Security – Redefining Auditing

Robert Knoedler, PE, CxA, EMP, Hanson Professional Services
Mat Coalson, Hanson Professional Services

Building owners are increasingly asking energy auditing and planning consultants to expand their services to include sustainability, resiliency, indoor environmental quality, carbon neutrality and security. Drivers have included pushes for carbon neutrality and net zero energy, the pandemic, water conservation needs, extreme weather, and a variety of cyber- and physical security threats. This session will examine this scope expansion and will offer some examples with lessons learned.

5:30 p.m. - 7:00 p.m. Reception in Expo Hall - Grand Sierra D & E

FRIDAY, APRIL 22

7:00 am - 9:00 a.m. Registration | 7:00 a.m. - 8:00 a.m. Breakfast

Reducing Energy 10-40% Without Capital Investments Using Existing Building Cx

Victor Saeh, CxA, CEM, LEED AP, PCC, SSRcx
Andy Charron, SSRcx

There are various approaches to developing a sustainable building energy plan range from an ASHRAE Level I or Level II Energy Audit, to some form of existing building commissioning. This presentation will discuss the Continuous Commissioning® process and the documented results for both building performance and cost savings for a healthcare facility that successfully implemented this strategy.

8:00 a.m. –
9:00 a.m.

Benefits and Cost Justification of Cloud-Based Energy Analytics

Thomas Yeh, CEM, CMVP, CBCP, CDSM, New York State Energy Research and Development Authority (NYSERDA)

New York State's Real-Time Energy Management program has incentivized over 600 cloud-based energy analytics deployments in commercial and multi-family buildings. This session will deliver a cross-section of cost-benefit analyses of energy analytic platforms spanning various construction vintages, mechanical systems, building end-uses, occupation patterns and technology providers, and show that benefits almost always justified total costs while improving building environments.

Looking to the Future: Embracing Total Cost of Ownership & Avoiding Unintended Consequences of Value Engineering

Robert Bucey, PE, CEM, BCxP, Jacobs Engineering
Chris Smith, PE, CxA, EMP, Jacobs Engineering

Value engineering is often focused on driving down first costs, and can determine whether a project will move forward or be scaled back. But VE activities are also an opportunity for commissioning & energy consultants to reinforce the primacy of the owner's needs. This session will discuss using the concept of Total Cost of Ownership, to help owners and the project team avoid unintended consequences from considering only first cost and schedule impacts.

9:15 a.m. –
10:15 a.m.

Go Beyond Traditional Cx Processes: Ensuring Mission-Critical Facilities are Operationally Ready

Alex Kozinets, PE, EBCP, LEED AP, Facility Grid
Craig Eadie, Straightline Consulting Limited

Commissioning data centers and other mission-critical facilities requires going beyond the traditional processes to ensure a seamless transition from construction project to building operations. Unplanned outages or unprepared systems and staff can have serious consequences for ongoing operations.

Commissioning of Federal Buildings

Baskar Subbarao, PE, CxA, CMVP, LEED AP, Zodiac, Inc.

This focused discussion will cover commissioning for U.S. Government customers, marketing to the government, and partnering with other companies to be a better provider to federal customers. The session will include specific approaches to federal building commissioning, high performance building, guiding principles, approaches, documentation, lessons learned, and guidelines and mandates for new building and existing building.

10:30 a.m. –
11:30 a.m.

Better Buildings for a More Sustainable Future

Amy Pastor, PE, CxA, LEED AP BD+C, EXP

Commissioning has always been linked to sustainability because it helps ensure optimized operations and a reduction in energy and water use. It also reduces the global impact that our buildings have on the environment through reducing greenhouse gas emissions. This session will look at commissioning and energy management through a sustainable lens, guiding participants through the different commissioning requirements within various rating systems and codes and how we can integrate commissioning into all projects and show GHG reductions through reported energy savings.

GRAND SIERRA H & I**CURACAO 5, 6, 7 & 8****Integrating Proper Building Enclosure into the Design Process**

Robert Barfield, AIA, NCARB, CCCA, BECxP, CxA+BE, Gresham Smith

4:30 p.m. –
5:30 p.m.

Today's large building projects too often do not properly integrate the building enclosure into the design process, resulting in unnecessary design interactions and revisions. This session will highlight how to properly carry out that integration through the building enclosure commissioning provider, ensuring timely recommendations and advice that enhances the quality of the project while incorporating all of the necessary and required aspects of building enclosure commissioning.

More Commissioning, Less Wasted Time: Trends in Software Integration & Automation

Jacob Terry, CxAlloy

This session will highlight four trends that we see influencing the future of commissioning work. These will include the increased integration of commissioning teams and data with other stakeholders' teams and data systems, the burgeoning use of automated checklist and test execution, the data-center-driven push towards more rigorous and analytical commissioning processes, and the increasing demands for fine-grained data capture during commissioning.

5:30 p.m. - 7:00 p.m. Reception in Expo Hall - Grand Sierra D & E

Program schedule and session listings are accurate as of March 21, 2022.

7:00 am - 9:00 a.m. Registration | 7:00 a.m. - 8:00 a.m. Breakfast

Building Readiness and Reopening: Guidance and Case Studies

Wade Conlan, PE, CxA, BCxP, LEED AP, Hanson Professional Services

8:00 a.m. –
9:00 a.m.

This session will highlight the core recommendations of ASHRAE's Epidemic Task Force (ETF) including Building Reopening Guidance regarding systems evaluation and mitigation strategies in the age of COVID-19, including balancing reduced risk of infection and energy costs. Real-world examples of evaluation will be drawn from K-12 and college campus projects, as well as a case study of the IAQ pathway for a large university campus.

Staircase Pressurization Systems: How to Manage Risk, Commission and Hand Over

Adam Muggleton, MRICS, CxA, AESG

Staircase pressurization systems comprise MEP, ELV and architectural elements. They are everyone's and no one's responsibility during construction and testing. They require domain knowledge, risk management and ownership to ensure they are tested and handed over without delaying building occupancy. This presentation will explain design and construction Cx related issues, and review the framework for commissioning and handover, taking a "systems" approach and viewing commissioning through a lens of risk management.

What to Expect When You're Expecting Fault Detection & Diagnostics (FDD)

Eliot Crowe, Lawrence Berkeley National Laboratory

9:15 a.m. –
10:15 a.m.

Fault detection & diagnostics (FDD) analytical software is growing in popularity as a tool to support monitoring-based commissioning. What would you expect to uncover when using these tools, and what can they tell us about the reliability of commercial HVAC systems? This session will share key insights from a recent study by LBNL using data from over 60,000 pieces of equipment across different FDD tools, climate zones, and building types, and summarize what the findings mean for the Cx industry.

Optimizing Domestic Hot Water Systems for Peak Performance

Greg Swafford, CPD, GPD, GF Piping Systems

Commercial and institutional facilities can have large, complex domestic hot water systems. The key to occupant safety, reduced energy costs, and maximized water use is to ensure that systems are operating at peak performance. In this session, we review common problems with domestic hot water delivery, the impact of uncontrolled temperatures, and outline a strategy to optimize performance with emerging automation technology.

Case Studies: Improved Hydronic System Performance Via Effective Air & Dirt Elimination

Stephen Clinton, PE, LEED AP, Spirotherm

10:30 a.m. –
11:30 a.m.

This presentation will address how air entrained in a hydronic system fluid negatively affects the start-up, testing and balancing, commissioning, first-year warranty period, and ongoing operation and maintenance of typical hydronic cooling and heating systems that contain a fluid-air mixture. Using numerous case studies to identify and quantify performance improvements, the session will show how to reduce total cost of ownership across a wide variety of system types, sizes, configurations, and conditions through air and dirt elimination.

Integrating Energy Modeling and an Energy Management Information System with Building Commissioning

Dotty Hage, PMP, CSM, MelRok, LLC; Marlin Addison, MS Addison & Associates, LLC; Adam Williams, PE, CxA, SCMS, Inc.

Development of energy management and information system (EMIS) tools such as data analytics and fault detection & diagnostics plus the use of building energy modeling (BEM) has enabled building owners to add energy performance requirements to the OPR. This session explores how proper integration of these new tools with commissioning increases the accuracy of pre-handoff Cx services, and leads to more comprehensive Cx services extending through warranty and into ongoing commissioning.

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- ▣ Commissioning-based approach to energy management results in maximum energy efficiency and building optimization.
- ▣ Meets "Qualified Energy Auditor" requirements for the ASHRAE Standard 211, the world's first comprehensive standard for energy audits.
- ▣ As a subsidiary of ACG, EMA and the EMP program are supported by the largest network of independent certified commissioning providers in the world.
- ▣ Cities, states and utilities increasingly cite the EMP as a qualifying credential to perform energy-related work. Stay ahead of the game!

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1 p.m. - 5 p.m.
Eastern each day

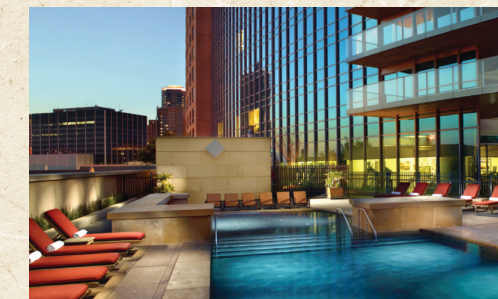
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CxENERGY 2023

May 2-5, 2023



Omni Fort Worth Hotel | Dallas/Fort Worth, TX

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The **Associated Air Balance Council (AABC)** is dedicated to the advancement of independent, third-party testing and balancing. The association's mission is to certify highly qualified, independent test and balance agencies, and their personnel.

www.aabc.com



The **AABC Commissioning Group (ACG)** is dedicated to the advancement of independent, third-party commissioning professionals. ACG strives to promote a better understanding of the commissioning process and to educate, train, and certify qualified individuals.

www.commissioning.org



The **Energy Management Association (EMA)** is dedicated to advancing the quality of energy management for the benefit of the building owner. EMA is committed to the certification and training of Energy Management Professionals (EMPs).

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