

CONFERENCE PROGRAM

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APRIL 15-18, 2019
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Steven "Rusty" Ross
P.E., CxA, EMP
SSRCx

Welcome to CxENERGY 2019!

Dear Colleagues:

On behalf of ACG and the other supporting organizations, thank you for being a part of **CxEnergy 2019!**

CxEnergy is the only industry event dedicated to building commissioning and energy management in buildings and facilities. The event's growth and the enthusiasm surrounding it reflect our professions' vital role in energy efficiency and optimizing performance, and our professionals' commitment to excellence.

This year's 32 presentations offer a superb mix of topics and case studies from the best-known

companies in engineering, manufacturing and technology. We also have nearly 50 exhibitors eager to showcase their products and services. And, as always, **CxEnergy's** agenda provides plenty of opportunities to network.

It would not be possible to conduct a conference and expo of this quality without the support of our members, sponsors, speakers and exhibitors. Thank you again and I hope you enjoy **CxEnergy 2019!**

Sincerely,

Rusty Ross, P.E., CxA, EMP
ACG President

PROGRAM AT A GLANCE

TIME	MONDAY, APRIL 15	TUESDAY, APRIL 16
7:00 am - 8:00 am	Registration for CxA Workshop & EMP Seminar	
8:00 am - 5:00 pm	Commissioning Authority (CxA) Workshop & Exam (Breakfast & Lunch)	
8:00 am - 5:00 pm	Energy Management Professional (EMP) Seminar & Exam (Breakfast & Lunch)	
8:30 am - 4:30 pm		AABC Test & Balance Seminar (Breakfast & Lunch)
8:30 am - 4:30 pm		NIBS BECx Workshop (Breakfast & Lunch)
5:00 pm - 6:30 pm	AABC TAB Seminar Reception	
5:00 pm - 7:00 pm		Welcome Reception in the Expo Hall

TIME	WEDNESDAY, APRIL 17	THURSDAY, APRIL 18
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	
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	



Breakfast and lunch will be provided for all pre-conference workshops and seminars.

CxENERGY 2019 PRESENTED BY



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.



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.



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).

PRE-CONFERENCE PROGRAM



BOCA VII Commissioning Authority Workshop & Exam

Monday, April 15 – Tuesday, April 16
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.



BOCA V Energy Management Professional Seminar & Exam

Monday, April 15 – Tuesday, April 16
8:00 am – 5:00 pm, \$950

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. The 4-hour, closed-book EMP exam is offered at the end of the second day to prequalified candidates.



EMA Golf Tournament sponsored by SSRCA[®]

Tuesday, April 16
7:00 am (meet in the hotel lobby)

The Energy Management Association cordially invites you to join us for an exciting day at the EMA Golf Tournament at Villas of Grand Cypress on **Tuesday, April 16**. Contact Cyndie Graddy at meetings@commissioning.org for any questions.



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

Tuesday, April 16
8:30 am – 4:30 pm, \$250

This series of in-depth, practical presentations include case studies on fan performance and water system rebalance, duct pressure testing, maintaining outside airflow, and taking coil face airflow measurements. These presentations are geared to helping commissioning providers, engineers, and test & 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.

Participants are invited to a reception on Monday, April 15 (5:00 pm - 6:30 pm) to enjoy complimentary cocktails and hors d'oeuvres as well as network with AABC test & balance professionals.



HIBISCUS NIBS BECx Workshop

Tuesday, April 16
8:30 am – 4:30 pm, \$250

This six-hour pre-conference offering led by experts from the NIBS Building Enclosure Technology and Environment Council will cover three of their eight BECx modules:

BEcx Standards and Process: an intro to the process and requirements outlined by ASTM, LLED, and the IgCC.

BEcx Lab Testing: a review of lab test standards and manufacturer testing used to set performance standards in project specs.

BEcx Control Layers 2: theories and best practices for installation of insulation and thermal breaks, air and vapor barriers.

Participants who also complete the other five modules through NIBS will be eligible to earn the ASTM/NIBS BECx certificate by successfully passing a capstone exam.

Welcome Reception in the Exhibit Hall

Tuesday, April 16
5:00 pm – 6:30 pm, Free to Attendees

Join us in the Exhibit Hall for the official opening of **CxEnergy 2019**. 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.



7:00 am - 6:00 pm Registration | 7:00 am - 8:00 am Breakfast

8:00 am - 8:45 am Opening Plenary – ACG & EMA Reports Plus Keynote Speaker

5G: A Game Changer for Cx & Energy Management, *Steve Schmerber, CommScope*

The fifth generation of cellular mobile communications is here, and the technology's exponentially higher data transmission rates, advances in efficiency, and massive device connectivity means changes are in store for your profession.

8:45-9:45 Meet & Greet with Sponsors & Exhibitors in the Expo Hall

10:00 am - 11:00 am

Tales of Commissioning & Net Zero Building: Lombardo Center at Millersville University

CARIBBEAN I

Shannon Kaplan, P.E., LEED AP, AKF
Brendan McGrath, P.E., LEED AP, AKF

The Lombardo Welcome Center is designed to be Millersville's first Zero Energy Building. Now open, the building stands as a clear testament to the owner's commitment to sustainability and to the goal of pursuing carbon neutrality by 2040. This case study presentation examines the challenges and rewards associated with this ambitious project.

FDD Software to Support Monitoring-based Commissioning & Building Optimization

BOCA I

Peter Serian, P.E., CopperTree Analytics

This session explores how advanced energy and building analytics software unlocks the power of BAS data to enable monitoring-based commissioning, giving owners and energy managers the insights to improve energy efficiency, occupant comfort, and equipment longevity. An overview of Fault Detection & Diagnostics (FDD) tools will be presented. These tools allow users to leverage BAS data to automatically and continuously identify energy saving measures.

Energy Procurement: Next Level Practices for Today's Energy Management Professional

CARIBBEAN II

Kevin Hamilton, NuEnergy

Purchasing energy at the best price is complex. It's not enough to just choose what appears to be the lowest price. During this deep-dive session, discover practices that enable energy managers to identify market changes, maximize energy savings, control operating costs and monitor performance. We will also include instruction on energy procurement knowledge required by the DOE Better Buildings Workforce used in EMA's EMP certification program.

A Pragmatic Approach to Getting the Most out of Chilled Water Systems

BOCA V

Mark Gallagher, Armstrong Fluid Technology

Upgrade decisions for central chilled water plants are often based on partial, sometimes erroneous information. Avoid costly mistakes by first understanding the existing equipment and characteristics of the plant. By using a structured approach to optimizing existing equipment, the most cost-effective savings are captured first, ensuring maximum ROI. The presentation covers how to identify opportunities in central plant optimization and the steps to address inefficiency.

11:15 am - 12:15 pm

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

CARIBBEAN I

Jim Hall, P.E., TBE, CxA,
Systems Management & Systems Balancing, Inc.

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.

Implementation of a Strategic Campus Sustainability and Energy Plan

CARIBBEAN II

Nate Boyd, P.E., LEED AP, University of Central Florida
Wade Conlan, P.E., CxA, LEED AP,
Hanson Professional Services, Inc.

The University of Central Florida is one of the nation's largest and most aggressive in pursuing energy efficiency, successfully implementing measures to conserve energy and reduce costs by 42.5% over 14 years. This is due in large part to their Energy and Sustainability Policy. This presentation analyzes the implementation of the policy, covering issues including energy assessments, commissioning, and long-term goals like achieving carbon-neutrality.

Managing Commissioning in a 185-Facility Health Care Corporation

BOCA I

Robert Langford, P.E., CxA, Hospital Corporation of America (HCA)

This presentation will focus on how HCA utilizes a Cx database to assist two commissioning agents with this workload. HCA is also applying the Cx database to improve the Cx process by identifying and eliminating common issues, as well as monitor contractors' performance. There have been lessons learned along the way.

Using Infrared Technology to Define Energy Saving Opportunities

BOCA V

Jim Park, I-Star Energy Solutions

This presentation provides information on what infrared measures and how to make use of the measurements. It demonstrates the importance of infrared training to properly and effectively use the technology and why infrared is an effective tool to find energy saving opportunities. It will open eyes to the possibilities for infrared analysis and demonstrate to energy service providers the opportunities to create value to clients.

12:15 pm - 1:45 pm Lunch in Exhibit Hall

2:00 pm - 3:00 pm

Commissioning Electrical Systems in Mission Critical Facilities

CARIBBEAN I

Paul J. Liesman, CxA, EMP, CFM, Jacobs Engineering
David M. Relko, P.E., CxA, Jacobs Engineering
Michael Trizzino, P.E., Jacobs Engineering

Commissioning electrical systems in mission critical facilities requires great care and planning. Performing this task correctly can save your clients the extreme costs and embarrassment of system outages due to improperly tested equipment or insufficient levels of testing. This presentation will detail the commissioning process and discuss important tasks and sequences required to successfully ensure your electrical systems will perform as intended.

The Case for Cx: Update of Landmark Study Shows Evolution of Cx Costs & Benefits 2004-2018

BOCA I

Eliot Crowe, Lawrence Berkeley National Lab

A Berkeley Labs 2004 study, updated in 2009, has long been considered the seminal work articulating the cost/benefit of commissioning, and is routinely cited to make the case for implementing Cx in new and existing buildings. This session will explore the results and findings of a 2018 update to the database and study, and discuss the challenges of accurate data gathering, particularly for ongoing and monitoring-based Cx.

Cybersecurity for Energy Managers

CARIBBEAN II

Christopher J. Markstein, P.E., Schneider Electric
Jesse Wiegand, Schneider Electric

Cybersecurity is an important aspect of project implementation, and will become critical as information and operations technologies converge. Vulnerabilities lead to loss of infrastructure, data breaches or interruption of business. This discussion covers the current state and developments in cybersecurity in facilities operations, building management, systems integration, and remote connectivity. Topics include common deficiencies leading to compromise and approaches to achieving and maintaining cybersecurity.

Water Audits & Water Management in the Energy Plant and Beyond

BOCA V

Dr. Valerie A. Shoup, Heritage Institute of Sustainability

As droughts and other factors steadily increase the cost of water, conservation becomes increasingly important, but energy engineers and facilities managers often overlook vast opportunities for water savings. This presentation, based on actual case studies, will discuss planning strategies and include how to benchmark, measure, document, and prioritize water management projects.

3:15 pm - 4:15 pm

Benchmarking and Operational Achievements at Willis Tower

CARIBBEAN I

Rick Walls, CxA, Rivion
Rock Ridolfi, CxA, Rivion

After months of effort, Rivion assisted Willis Tower (formerly Sears Tower), with achieving the ENERGY STAR certification, becoming the largest office building ever to do so. Building on this, they guided the property through simultaneous LEED Gold certifications in October, 2018. The challenges faced by the property throughout these processes and strategies used to overcome them and make the "impossible" possible will be discussed.

State of NFPA 3: Standard for Commissioning of Fire Protection & Life Safety Systems

BOCA I

Shawn Mahoney, National Fire Protection Association

The recent change of NFPA 3 from a recommended practice to a standard has important effects on commissioning for individual fire protection and life safety systems. This session will discuss why NFPA 3 was initially developed and how it evolved into a standard, who is involved in commissioning these systems and some common misconceptions related to commissioning them.

Greater than the Sum of its Parts: The Interdependence of MEP and Envelope Cx

CARIBBEAN II

Mark Gelfo, P.E., CxA, EMP, LEED Fellow
TLC Engineering Solutions
Darek Brandt, P.E., Walter P. Moore

While it has existed for years, Building Enclosure Commissioning (BECx) is still relatively new compared to commissioning MEP systems, and not as widely incorporated in the building industry. This presentation will discuss the "whole building" commissioning process, industry standards, and code requirements to show how a well-integrated BECx + MEP Cx process provides synergistic benefits to building owners and enhances building performance.

Using Data Analytics to Automate and Enhance the Commissioning Process

BOCA V

John Petze, SkyFoundry

Consultants in commissioning, energy management, monitoring and verification find data analytics software is a powerful tool, allowing automation of analysis that traditionally required continuous manual effort, and to provide new service offerings to improve facility performance and eliminate drift. This presentation provides examples of how software was applied to the commissioning process, delivering significant financial results and helping make energy and operational efficiency improvements permanent.

CONTINUED —

4:30 pm - 5:30 pm

Commissioning of the Mercedes-Benz Stadium: Massive Project...Details Matter CARIBBEAN I

Kevin Tolleson, CxA., WorkingBuildings

John McFarland, P.E., LEED AP, WorkingBuildings

The Mercedes-Benz Stadium in Atlanta is essentially a small city with a myriad of space uses, and systems and equipment to support them all. This presentation demonstrates how commissioning activities were incorporated as early as possible into the construction schedule, reveals how Cx data was tracked to resolution, and highlights Cx activities for the stadium's remarkable 1.2 million gallon rainwater retention and re-use system.

How Will NFPA 4's Integrated System Testing Affect Building Commissioning? BOCA I

Shawn Mahoney, National Fire Protection Association

The Standard for Integrated Fire Protection and Life Safety System Testing (NFPA 4) was developed to address a codes and standards gap. This session will identify the types of buildings that require integrated system testing, and what model codes will require testing to be completed. Finally, you will learn who is involved in integrated system testing and how you can either benefit, or be burned by, the new requirements.

Leveraging Your BMS System to Identify Issues Before They are Issues CARIBBEAN II

Ken Gilbert, LEED AP, Automated Logic Corporation

Today's building management systems provide extensive data and information that building operators don't leverage. Operational and energy efficiencies can be achieved with analytics, fault detection and diagnostics (FDD), and weather data. This presentation provides an overview of analytics and FDD. How they are implemented within BMS, how to use advanced analytics to predict facility issues, and how to use weather data to provide system control.

Energy Savings Opportunities on Compressed Air Systems BOCA V

Joe Ghislain, Compressed Air Challenge

If you are looking for additional areas of energy savings opportunity to add to your commissioning or retro commissioning activities, then compressed air systems -- and this presentation -- might just be what you are looking for. This presentation provides an overview of how taking a field-tested approach and applying best practices can improve a system, providing energy savings and leading to better energy management.

5:30 pm - 7:00 pm Reception in Exhibit Hall

THURSDAY, APRIL 18

7:00 am - 8:00 am Breakfast

8:00 am - 9:00 am

Commissioning a Biomass Heating System in a Remote Alaska Community CARIBBEAN I

Walter Heins, P.E., CxA, Coffman Engineers

Jonathan Fitzpatrick, Southeast Island School District

This case study examines the commissioning of a project in Alaska, where five communities developed a program in which biomass boilers not only heat the school and greenhouse, but provide community-strengthening opportunities for involvement and economic development. The Southeast Island School District (SISD) learned valuable lessons that led to improved Owner's Project Requirements, revised design criteria, and important startup and operational criteria.

Using State-of-the-Art Fault Detection & Diagnostics Tools in MBCx BOCA I

Guanjing Lin, PhD, Lawrence Berkeley National Lab

Automated Fault Detection and Diagnostics (AFDD) is a powerful tool in the fast-growing area of monitoring-based commissioning. This overview of recent Berkeley Labs research based on a vendor survey and direct engagement with users of AFDD technology will include a report on the current state of the market, success stories, and outstanding needs in the industry. It will also present a framework for evaluating the performance of AFDD algorithms.

4G Commissioning for a 5G World CARIBBEAN II

Jim Magee, CxA, EMP, LEED AP, Facility Commissioning Group

Ongoing competition between wired and wireless environments, smart cities and the IoT have evolving, profound impacts on our built environment. This presentation examines communications technology advancement pertaining to commissioning building systems. How will multiple control points and infinite points arrays affect how we program, operate and maintain building equipment? What commissioning administration, implementation, diagnostic and tracking tools are online or soon to be ready?

Commissioning in the Building Codes BOCA V

Jason Toves, International Code Council

Commissioning has been increasingly integrated into codes and standards. This program will review the commissioning requirements in the International Green Construction Code (IgCC), the International Energy Conservation Code (IECC), and the tools commissioning authorities and code officials can use to support compliance with these codes. These additional tools include standards, accreditation, guidelines, compliance forms and templates.

9:15 am - 10:15 am

Challenges of Phased Projects from the Commissioning Perspective

CARIBBEAN I

Dan Eckelkamp, CxA, Engineered Air Balance Co., Inc.

We'll explore the challenges presented to the commissioning process by projects that have a phased turnover schedule. We will review a recent multistory hospital for which the design did not account for a phased turnover approach, cover the challenges this produced, and the strategies devised to try to mitigate them.

Commonly Made Commissioning Mistakes

BOCA I

*Steven Metzgar, CxA, EMP, Gresham Smith
Johnathan Woodside, P.E., Gresham Smith*

Project schedules tighten and anxious clients shorten construction durations to meet aggressive schedules. Since functional performance testing and final commissioning activities are last, they are the first cut. The result is often functional performance tests not completed, reports unfinalized, incorrect equipment operation and owners left holding the bag. This list of commonly made mistakes and oversights illustrates a perfect storm of commissioning folly.

Evolution and Benefits of a District-Wide Commissioning Program

CARIBBEAN II

Drew Daly, CxA, Hanson Professional Services Inc.

Jonathan Noordzy, P.E., CxA, EMP, Hanson Professional Services Inc.

William Bradford, P.E., Hanson Professional Services Inc.

Orange County Public Schools is the ninth largest in the U.S. In 2009, OCPS initiated a commissioning program for new schools and major school additions limited to HVAC systems, construction and acceptance (testing) phase Cx services. Later, issues related to systems' design were identified during construction and the scope was expanded to include design and select submittal reviews, prior to construction.

IoT and Cloud Computing Meet ASHRAE to Deliver Productivity and Energy Savings

BOCA V

Deepinder Singh, 75F

According to the EPA, indoor air tends to be 2-5x more toxic than outdoors. This session will explain how newer IoT and cloud computing technologies enable pervasive Building Intelligence which improves IAQ, occupant health and productivity while reducing energy usage. It will also explain how ASHRAE 62.1 was adopted to take advantage of these technologies which increase operational efficiency.

10:30 am - 11:30 am

Is an Audit & Retro-Cx an Rx for Energy Savings?

CARIBBEAN I

*Al LaPera, CxA, EMP, TLC Engineering Solutions
Nick Dalesandro, P.E., Depository Trust Clearing Corporation*

Why do some energy management companies fail to achieve their goals, while others exceed them? This session will address common pitfalls and best practices, and apply these concepts to examine a recent successful audit and retro-Cx project, and why it was so successful that the local utility came out to replace the meter multiple times due to the reduced consumption readings.

Introduction to PACE: Funding for Energy Efficiency and Distributed Energy Projects

BOCA I

Scott Ringlein, The Energy Alliance Group of North America

PACE programs—which utilize a voluntary property tax assessment to secure funding—cover 100% of the cost for energy efficiency, water conservation, and distributed energy projects. To date, projects totaling \$750MM have been funded through the PACE program, which is now available in 36 states. This session—which includes two case studies—will discuss how PACE works, what types of improvements qualify and how much funding is available.

Trends in Water Treatment Planning for Legionellosis Mitigation and Prevention

CARIBBEAN II

Alok Kumar, P.E., EMP, NIKA

This presentation educates design engineers, building O&M staff, and building owners about health concerns related to Legionellosis, a form of pneumonia caused by the Legionella bacteria which lives in inadequately maintained building water systems. Attendees will learn how Legionellosis is spread in facility-wide water systems; understand the importance of proper water treatment system design and monitoring to prevent Legionellosis; and learn about its regulatory environment and best practices being implemented by water treatment experts.

Design for Dynamic Light: How to Create Successful Dynamic Lighting Systems

BOCA V

Dr. Ian Rowbottom, Lutron

Provides an overview of Dynamic Light and how it can be deployed. Details are provided on the process of creating use case scenarios through to a thorough sequence of operations. Quality of tunable lighting sources is shown in a way that can be easily specified based on performance. Further information is provided on the effect protocols have on design when implementing a Dynamic Lighting system.

11:30 am - 12:30 pm Closing Brown Bag Lunch

See you at **CxENERGY 2020!**

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RECOGNIZED PROGRAM

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Are you EMP Certified?

Here are the top 5 reasons you should be:

- The EMP is ANSI accredited and DOE Better Buildings recognized.
- Commissioning-based approach to energy management results in maximum energy efficiency and building optimization.
- Meets “Qualified Energy Auditor” requirements for the new 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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Sponsor/Exhibitor agrees to reserve the booth and pay the required amount before September 1, 2019. Sponsor/Exhibitor has the first opportunity to select the booth of choice once the floor plan becomes available. If Sponsor/Exhibitor fails to make any payments by the due date, ACG may terminate Sponsor/Exhibitor participation in CxEnergy 2019 without further notice and without any obligation to refund money previously paid. If Sponsor/Exhibitor cancels its participation in CxEnergy 2019, any monies paid may be retained by ACG.

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 at info@commissioning.org

Upcoming Certification Workshops & Seminars

Approved for 12 AIA CEUs (LU/HSW)



CxA Workshop & Exam

June 21-22 | Kansas City, MO

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 four-hour, closed-book CxA exam is offered at the end of the second day to prequalified candidates.

For more information,
email info@commissioning.org or
call 202-737-7775.

www.commissioning.org



ENERGY MANAGEMENT
PROFESSIONAL

EMP Seminar & Exam

June 21-22 | Kansas City, MO

EMA's 12-hour Energy Management Seminar is a comprehensive review of energy management techniques and technologies arranged to align with DOE's Better Buildings Workforce Guidelines scheme for Energy Managers. The four-hour, closed-book EMP exam is offered at the end of the second day to prequalified candidates.

For more information,
email info@energymgmt.org or
call 202-737-1334.

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