

2017 UAS FOR ELECTRIC UTILITIES

*The Business Case, Practical Considerations,
& Emerging Technology*

May 8-9, 2017
Chicago Marriott Oak Brook
Chicago, IL

Case Studies Include

CenterPoint's UAS
Utility Inspection Work Program

San Diego Gas & Electric's
UAS Internal Training Program

National Grid's
UAS Program Development

Southern California Edison's
UAS Program

Entergy UAS Reliability
Inspection

ComEd's Multi-Faceted
UAS Program

Xcel Energy



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OVERVIEW

For many utility industry observers, it's not a matter of whether drones will be integrated into the operational landscape—it's when. The practical applications of unmanned aircraft systems (UASs) are poised to transform the industry with strong implications for worker safety, system reliability, and data collection & storage. The opportunity to get an aerial view of transmission and distribution lines, towers, and poles without deploying a crew is attractive to many utilities.

This conference gathers industry experts to discuss all the important topics relevant to UAS use for electric utilities. An FAA representative will discuss the Final Rule for drones and its implications for the utility industry. National Grid, San Diego Gas & Electric, CenterPoint, Entergy, Southern California Edison, Com Ed, and Xcel Energy will provide case studies pertaining to their usage of UAS. EPRI will describe their cutting-edge research regarding drone use for electric utilities. NV Energy will explain data storage and security around UAS. Oak Ridge National Laboratory will discuss UAS technological advances and their application for the utility industry. Finally, a panel of experts will convene and discuss hot topics and audience questions regarding UAS.

LEARNING OUTCOMES

- Discuss current FAA rules and regulations pertaining to UAS and their implications for the utility industry
- Describe advances in sensors, systems & communications for utility-focused unmanned aerial systems
- Review CenterPoint's UAS utility inspection work program
- Explain San Diego Gas & Electric's UAS internal training program
- Discuss UAS data storage and security
- Address the technological advances and barriers that factor into UAS program decisions
- Describe National Grid's UAS program development
- Review Southern California Edison's UAS program operations and future fleet considerations
- Participate in a Q&A panel with experts from the UAS industry
- Explain UAS-based sensors and measurements and their utilization in the utility industry
- Discuss Entergy's UAS reliability inspection case study
- Describe Com Ed's UAS program, including risks, uses and benefits to date and plans for the future
- Review Xcel Energy's UAS program updates



“EUCI provides well rounded, informative conference of great interest to utilities. Their staff are professional facilitators who run great meetings.”

Principal Power Systems Engineer, Utility System Efficiencies, Inc.



“Very informative, perfect length.”

Program Manager, AVV Flight Services

AGENDA

MONDAY, MAY 8, 2017

7:30 - 7:55 am

Registration and Continental Breakfast

7:55 - 8:00 am

Welcoming Remarks

8:00 - 8:45 am

FAA Presentation: UAS Rules & Regulations

- Operating a drone under 14 CFR Part 107
- Updates & changes
- Impact on the utility industry
- Waivers

Mark Foisy, Aviation Safety Inspector - Unmanned Aircraft Specialist, FAA

8:45 - 9:30 am

Advances in Sensors, Systems & Communications for Utility-Focused Unmanned Aerial Systems

- Applications for IOUs, Munis and Co-ops
- Performance findings from a wide variety of trials and uses in urban, suburban and rural settings
- Electromagnetic interference of UASs in close proximity to distribution and transmission lines
- Legal and intellectual property implications for operation within utility service areas
- Applicability of consumer-grade UASs to industrial/utility settings

Peter Fuhr, Distinguished Scientist, Electronics & Electrical Systems Research Division, Oak Ridge National Laboratory

9:30 - 10:15 am

CenterPoint's UAS Utility Inspection Work Program



- Legal/FAA requirements
- UAS specifications/preferences/sensors
- Privacy and property owner notifications
- Work accomplished to date for CNP
- Planning and flying a circuit (planning, data capture, cataloguing, reporting)
- Highlights/lessons learned
- Future (sensors, waivers, GIS integration)

Daniel Perez, Reliability Engineer, CenterPoint Energy

Charles Winfree, Director of Commercial Operations, Aviation Unmanned

10:15 - 10:45 am

Networking Break

10:45 - 11:30 am

San Diego Gas & Electric's UAS Internal Training Program



- The selection process and Part 107 Qualification: Becoming legal to fly, clearing the barrier to entry
- Classroom training: Establishing the foundation, understanding the system and the rules
- Practical training: Learning how to fly, applying company UAS practices
- Records and management: What happens after training is complete, currency and proficiency

Hector Ubinas, UAS Program Lead / Aviation Safety Advisor, San Diego Gas & Electric

Christine Asaro, Project Advisor, San Diego Gas & Electric



"I was able to take away some invaluable information and potential new relationships that I otherwise would not have been privy to if I had not attended this EUCI conference."

Inspection Technician, Ontario Power Generation

AGENDA

MONDAY, MAY 8, 2017 (CONTINUED)

11:30 am - 12:15 pm

UAS Data Storage and Security

- Data security
 - o Importance
 - o In-flight security
 - o Real-time data transfers
 - o Post-flight transfers
- Data integration
 - o Current applications
 - o Alternative/new applications
 - o Future applications
- Data storage
 - o Storage period
 - o Alternate uses
 - Anomaly notifications
 - o Benefits of having historical data

Cheree Boteler, Senior Marketing Specialist, NV Energy

12:15 - 1:00 pm

Group Luncheon

1:00 - 1:45 pm

Next Generation Technologies: Accelerating UAS Economics

- Electric utilities have unique and broad environments and use cases. These need to be well understood when preparing to use a new technology. What questions are left?
- UAS can be disruptive, but it has to be about more than a drone.
- Scalability is the key to successful widespread use. What are the barriers and what can we do about it?
- What are the key technologies that we are still waiting on?

Drew McGuire, Project Manager, EPRI

1:45 - 2:30 pm



National Grid's UAS Program Development

- Recapping UAS field demonstrations
- UAS internal corporate policy development
- Internal near-term use case priorities

Jacquelyn Bean, Lead Analyst, National Grid

2:30 - 3:15 pm



Southern California Edison's UAS Program

- Identifying the concept of operations
- Inaugural model selection/Program development
 - o Dictated by desired inspection method
 - o Fixed Wing vs. Rotorcraft/Multirotor
 - o Airframe independent of sensor – "Futureproofing"
 - o Budget
- Research & development
 - o New "out of the box" industry solutions
- Operations
 - o Certification and training
 - o Crew resource management (CRM)
 - o Insurance/Liability
 - o Balancing client expectations with regulatory realities
- Future fleet considerations
 - o Additional capabilities
 - o Evolving regulations
 - o Newly identified applications

Craig Stenberg, Flight Operations Supervisor, Southern California Edison

AGENDA

MONDAY, MAY 8, 2017 (CONTINUED)

3:15 - 3:45 pm

Networking Break

3:45 - 5:00 pm

PANEL: Practical Considerations: UAS Integration into the Utility Industry

Hector Ubinas, UAS Program Lead / Aviation Safety Advisor, San Diego Gas & Electric

Linda Rhodes, Operational Strategy & Business Intelligence - Strategic Initiatives, Com Ed

Stephen (Tison) Reno, Engineer- Distribution Asset Management, Entergy

Peter Fuhr, Distinguished Scientist, Electronics & Electrical Systems Research Division, Oak Ridge National Laboratory

Nathan Schuett, CEO, PreNav

Charles Winfree, Director of Commercial Operations, Aviation Unmanned

TUESDAY, MAY 9, 2017

8:00 - 8:30 am

Continental Breakfast

8:30 - 9:15 am

UAS-Based Sensing and Measurements

- Image sensors
- Chemical sensors
- LIDAR
- Weather sensor
- How environment factors into sensing and measurements

Marissa Morales-Rodriguez, Research and Development, Oak Ridge National Laboratory

9:15 - 10:00 am



Entergy UAS Reliability Inspection Case Study

- Inspected 9 miles of distribution feeder trunk across 4 circuits
- Contracted UAS operator for inspections
- Study compares aerial inspection to standard ground inspection methods
- Specialized software used to review data post aerial inspection

Stephen (Tison) Reno, Engineer - Distribution Asset Management, Entergy

10:00 - 10:30 am

Networking Break



"A rich environment for collaboration and sharing best practices information."

Flight Ops Supervisor, Southern California Edison



"Attending the UAS for Electric Utilities conference is highly recommended as it is a great way to hear how utilities are using UAS in the US. This conference was a one stop shop!"

Project Advisor, San Diego Gas and Electric

AGENDA

TUESDAY, MAY 9, 2017 (CONTINUED)

10:30 - 11:15 am



ComEd's Multi-Faceted UAS Program

ComEd will provide an overview of UAS risks, uses and benefits to date and plans for the future

- Flights to date have demonstrated the ability of UASs to do the following:
 - o Mitigate injury risks and hazards to employees
 - o Capture system images not available by existing assessment methods
 - o Capture images of energized equipment that otherwise require de-energizing
- A primary goal is to provide actionable information to end users
 - o Process description and examples
- UAS flight mission lessons learned
 - o Effective use of payloads, emergent uses, etc.
- Financial business cases
 - o Our journey and next steps

Linda Rhodes, Operational Strategy & Business Intelligence - Strategic Initiatives, Com Ed

11:15 am - 12:00 pm



Xcel Energy

- How Xcel Energy plans to use UASs
- Xcel & Environmental Consultants UAS case study
- Utilities & consultants: Best practices for working cohesively

Eileen Lockhart, UAS Program Manager, Xcel Energy

12:00 pm

Conference Adjourns

SPEAKERS

Christine Asaro, Project Advisor, San Diego Gas & Electric

Jacquelyn Bean, Lead Analyst, National Grid

Cheree Boteler, Senior Marketing Specialist, NV Energy

Mark Foisy, Aviation Safety Inspector- Unmanned Aircraft Specialist, FAA

Peter Fuhr, Distinguished Scientist, Electronics & Electrical Systems Research Division, Oak Ridge National Laboratory

Eileen Lockhart, UAS Program Manager, Xcel Energy

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INSTRUCTIONAL METHODS

Case studies, PowerPoint presentations and group discussion will be used in this event.

REQUIREMENTS FOR SUCCESSFUL COMPLETION

Participants must sign in/out each day and be in attendance for the entirety of the conference to be eligible for continuing education credit.

IACET CREDITS



EUCI has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET). In obtaining this accreditation, EUCI has demonstrated that it complies with the ANSI/IACET Standard which is recognized internationally as a standard of good practice. As a result of their Authorized Provider status, EUCI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standard.

EUCI is authorized by IACET to offer 1.0 CEUs for the conference.

EVENT LOCATION

A room block has been reserved at the Chicago Marriott Oak Brook, 1401 West 22nd Street, Oak Brook, IL 60523, for the nights of May 7-9, 2017. Room rates are US \$179 plus applicable tax. Call **1-630-573-8555** for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is April 16, 2017 but as there are a limited number of rooms available at this rate, the room block may close sooner. ***Please make your reservations early.***

REGISTER 3, SEND THE 4TH FREE

Any organization wishing to send multiple attendees to these conferences may send 1 FREE for every 3 delegates registered. Please note that all registrations must be made at the same time to qualify.

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Please contact Erin Burba at eburba@euci.com or 720-988-1260 for more information.

REGISTRATION INFORMATION

Mail Directly To:

Electric Utility Consultants, Inc. (EUCI)
4601 DTC Blvd., Ste. 800, Denver, CO 80237
OR, scan and email to: conferences@euci.com

WWW.EUCI.COM

p: 303-770-8800

f: 303-741-0849

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PLEASE SELECT

- 2017 UAS FOR ELECTRIC UTILITIES CONFERENCE**
MAY 8-9, 2017: US \$1395
EARLY BIRD ON OR BEFORE APRIL 21, 2017: US \$1195
- I'M SORRY I CANNOT ATTEND, BUT PLEASE EMAIL ME A LINK TO THE CONFERENCE PROCEEDINGS FOR US \$295

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How did you hear about this event? (direct e-mail, colleague, speaker(s), etc.)

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OR Enclosed is a check for \$ _____ to cover _____ registrations.

Substitutions & Cancellations

Your registration may be transferred to a member of your organization up to 24 hours in advance of the event. Cancellations must be received on or before April 7, 2017 in order to be refunded and will be subject to a US \$195.00 processing fee per registrant. No refunds will be made after this date. Cancellations received after this date will create a credit of the tuition (less processing fee) good toward any other EUCI event. This credit will be good for six months from the cancellation date. In the event of non-attendance, all registration fees will be forfeited. In case of conference cancellation, EUCI's liability is limited to refund of the event registration fee only. For more information regarding administrative policies, such as complaints and refunds, please contact our offices at 303-770-8800. EUCI reserves the right to alter this program without prior notice.

