

# 2017 UAS FOR ELECTRIC UTILITIES

**October 16-17, 2017**  
**Denver Marriott West**  
**Denver, CO**



## CASE STUDIES

**Com Ed**

**CenterPoint Energy**

**Florida Power & Light**

**National Grid**

**Ontario Power Generation**

**Xcel Energy**

## PRE-CONFERENCE WORKSHOP

**Automated Detail Inspections:  
Live Field Demonstration  
& UAS Data Analysis**

MONDAY, OCTOBER 16, 2017



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EUCI is authorized by IACET to offer 1.0 CEUs for the conference and 0.4 CEUs for the workshop

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**SHARPER SHAPE**  
The Global Leader in UAV Based Automated Inspection.

SUPPORTING ORGANIZATION



## OVERVIEW

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This conference gathers industry experts to discuss all the important topics relevant to UAS use for electric utilities.

- An FAA UAS expert will discuss rules and regulations pertaining to UAS and their implications to the utility industry
- Xcel Energy's UAS Program Manager will provide new updates regarding their program
- CenterPoint Energy will discuss their UAS program and review a storm restoration demo
- Ontario Power Generation will describe the evolution of their UAS program and provide a Canadian nuclear perspective
- NRECA will discuss current UAS projects administered by electric utility coops
- Florida Power & Light will detail their UAS program
- ComEd will discuss successful customer notification strategies during UAS utilization
- National Grid will provide the latest details regarding their UAS program

Attendees will have the opportunity to participate in a Q&A panel with UAS experts. They will discuss cutting-edge UAS technologies including automated detailed inspection. They will hear from Oak Ridge National Laboratory regarding their highly anticipated early survey of best practices for the use of small UAS by the electric utility industry. Don't miss the chance to meet with industry experts and have all your questions answered!

## LEARNING OUTCOMES

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- Discuss current FAA rules and regulations pertaining to UAS and their implications for the utility industry
- Describe the latest updates to Xcel Energy's UAS program
- Review CenterPoint Energy's UAS program and review a storm restoration demo
- Explain the evolution of Ontario Power Generation's UAS program
- Discuss current UAS projects administered by electric utility coops
- Assess Florida Power & Light's UAS program
- Describe ComEd's process for customer notification regarding UAS utilization
- Participate in a hot topics panel with UAS experts
- Explain automated detailed inspection & its uses in the electric utility industry
- Review updates to National Grid's UAS program
- Review an early survey of best practices for the use of small UAS by the electric utility industry
- Discuss cutting-edge technologies for UAS programs

## WHO SHOULD ATTEND

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- EPCs (Engineering/Procurement/Construction)
- Surveyors
- Technology Leads
- Geographic Information Officers
- Supervisor of GIS
- Director of Operations
- Operations & maintenance professionals in electric transmission & distribution
- T&D line inspection maintenance personnel
- T&D safety personnel
- Security professionals in the utility industry
- Attorneys who work in the utility industry
- Anyone else interested in learning more about how UAS can be used within T&D

# AGENDA

MONDAY, OCTOBER 16, 2017

12:30 - 1:00 pm

## Registration

1:00 - 1:45 pm

## FAA Presentation: UAS Rules & Regulations

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

**Al Brunner, Aviation Safety Inspector- UAS, FAA**

1:45 - 2:30 pm



## Xcel Energy

- How Xcel Energy uses UASs
- Xcel UAS case study
- Current updates to Xcel Energy's UAS program

**Eileen Lockhart, UAS Program Manager, Xcel Energy**

2:30 - 3:00 pm

## Networking Break

3:00 - 3:45 pm



## Florida Power & Light

- Blue Sky inspection program
- Environmental inspection program
- Storm response inspection program
- FPL's Next Steps

**Eric Schwartz, Lead Project Manager- Smart Grid & Innovation, Florida Power & Light**

3:45 - 5:00 pm

## PANEL: Practical Considerations: UAS Integration into the Utility Industry

**Linda Rhodes, Operational Strategy & Business Intelligence - Strategic Initiatives, ComEd**

**Daniel Perez, Reliability Engineer, CenterPoint Energy**

**TJ Kirk, Associate Analyst- Distributed Energy Resources, NRECA**

**Sabrina Nestor, Manager- Inspection and Maintenance Services, Ontario Power Generation**

**Constantin Diehl, President & CEO, UAS Colorado**



*"I really enjoyed learning from other utilities and meeting industry counterparts. Our program will definitely benefit from attending this conference."*

UAS Program Lead, 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



*"I find these smaller conferences highly valuable due to the ready access to experts and more intimate networking."*

Manager, Projects, ComEd

# AGENDA

TUESDAY, OCTOBER 17, 2017

7:30 – 8:00 am

**Continental Breakfast**

8:00 - 8:45 am

**An Early Survey of Best Practices for the Use of Small Unmanned Aerial Systems by the Electric Utility Industry**

- Unmanned aerial system electric utility work inspection execution
- UAS flight operations—Execution checklist
- Recommended approach distances to electric infrastructure
- Sensors used—Systems integration

***Rick Lusk, Oak Ridge National Laboratory***

8:00 - 8:45 am

**Unleashing the Potential for Drone Usage at Public Power Utilities**

- Organizational considerations that make public power utilities unique utility drone operators
- State and local laws that impact utility drone operations
- Examples of public power utilities that have implemented drone technology
- Existing legislative and regulatory “gaps” for drone regulations

***Andrew Wills, Director of Government Relations and Counsel, American Public Power Authority***

9:15 - 10:00 am



**Transitioning to Operational Use of UAS**

- Policies and procedures governing use
- Emerging updates National Grid’s UAS program
- Recapping UAS field demonstrations

***Jacquelyn Bean, Lead Analyst, National Grid***

10:00 - 10:30 am

**Networking Break**

10:30 - 11:15 am

**NRECA: A Cooperative Perspective**

- Results of cooperative drone case studies including remote terrain inspection, vegetation management & thermal imaging
- Discussion of the business case for UAS
- Challenges for UAS adoption in the electric industry

***TJ Kirk, Associate Analyst- Distributed Energy Resources, NRECA***

11:15 am - 12:00 pm



**CenterPoint Energy UAS Program & Storm Restoration**

- 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)
- Storm restoration demo

***Daniel Perez, Reliability Engineer, CenterPoint Energy***

12:00 - 1:00 pm

**Group Luncheon**

# AGENDA

TUESDAY, OCTOBER 17, 2017 (CONTINUED)

1:00 - 1:45 pm



## Evolution of an UAV Inspection Program – a Canadian Nuclear Perspective

A series of case studies have been performed, from the initial proof of concept, testing several UAVs with varied payload configurations, and to showcase successful field trials.

- The first UAV case study, driven by Canadian Nuclear requirements, dramatically reduced the inspection time from several days to a series of 4 - 12 minute inspections, resulting in reduced risk to staff performing the work and substantial savings to the company.
- Intensive follow-up into the UAV market, research and coordination with operators, manufacturers and regulators, led to the purchase of several UAVs (Skyranger, Albris, Elios and DJI) for different applications.
- Additional case studies on Ice-boom inspections and dam safety spillways where Ontario Power Generation (OPG) collaborated with New York Power Authority (NYPA), and power plant exterior inspections give a unique field perspective on the challenges, and decisions made when adopting this technology for industrial inspections.
- The demonstrated success of these case studies has led to additional investment and growth in this area, to further utilize this evolving technology as a leading inspection program.

**Sabrina Nestor, Manager- Inspection and Maintenance Services, Ontario Power Generation (Invited)**

1:45 - 2:30 pm

## Emerging Technology: Modeling Power Lines in 3D

Emerging technology allows power lines to be automatically modeled in 3D using existing LiDAR data of the system. All structures and lines are identified, and specific areas of interest are located. Software then uses this data to create an optimal route for the drone to autonomously inspect these assets at close range and from multiple angles. Images from insulators, wire connections and other critical components are automatically captured, and these images are uploaded to the cloud-based application. Post-flight inspection is further assisted with artificial intelligence tools. This session will discuss the advantages and latest developments of Automated Detailed Inspections (ADI) technology, as well as how to create an optimized environment for manual examination of inspection data.

**Chris McMurtry, Solutions Architect, Sharper Shape, Inc.**

2:30 - 3:00 pm

## Networking Break



***“Absolutely wonderful conference, by the way. All topics were extremely relevant and covered well. The networking opportunity was the best I’ve experienced so far!”***

Operational Strategy & Business Intelligence - Strategic Initiatives, ComEd



***“Attending the UAS for Electric Utilities conference is highly recommended as it is a great way to hear about how utilities are using UAS.”***

Project Advisor, San Diego Gas & Electric

# AGENDA

TUESDAY, OCTOBER 17, 2017 (CONTINUED)

3:00 - 3:45 pm



### ComEd's UAS Utility Uses: Customer Notifications

This session will make the case for maintaining transparency with UAS activity along with a positive image – and how that helps to facilitate our ability to use this technology without controversy throughout our service territory and beyond.

From notifications to municipalities and large customers about specific missions to regular messaging via social media, expos and other outlets, ComEd will share how they're building and maintaining a positive and supportive brand.

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

3:45 - 4:30 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**

4:30 pm

### Conference Adjourns



*"This outstanding conference brings together in one room the level of collaborations rarely found in our industry."*

CTO, RBS Drone Technologies



*"EUCI provided a well-rounded, informative conference of great interest to utilities. Their staff are professional facilitators who run great meetings."*

Principal Power System Engineer, Utility System Efficiencies, Inc.



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

Flight Ops Supervisor, Southern California Edison

## PRE-CONFERENCE WORKSHOP

# Automated Detail Inspections:

## *Live Field Demonstration & UAS Data Analysis*

MONDAY, OCTOBER 16, 2017

**8:00 – 8:30 am**            **Registration & Continental Breakfast**

**8:30 am – 12:00 pm**    **Workshop Timing**

## OVERVIEW

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This pre-conference workshop will provide EUCL attendees with a live field demonstration of Automatic Detailed Inspection (ADI) technology. The workshop will begin with an analysis of existing LiDAR data to automatically create flight plans for inspecting several Denver-area transmission towers. These automatically derived VLOS flight plans will then be used to perform a live autonomous, detailed inspection of the transmission structures. After the flights have been completed, the captured images will be uploaded to the cloud-based software, and workshop attendees will review inspection assets and create reports using data obtained from field demonstration. By the end of the demonstration, participants will have a solid understanding of the ADI concept and what it looks like in the field.

## LEARNING OUTCOMES

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- Analyze existing LiDAR data
- Create inspection flight plans
- Review VLOS flight plans
- Participate in a live demonstration of transmission structure inspection
- Review inspection assets
- Create reports using data obtained from field demonstration
- Address how to inspect large amounts of data from multiple sensors

# WORKSHOP AGENDA

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MONDAY, OCTOBER 16, 2017

- Overview
  - Analysis of existing LiDAR data
  - Creating inspection flight plans
  - VLOS flight plans
- Field Trip: Live Field Demonstration of Transmission Structure Inspection
  - Autonomous detailed inspection of the transmission structures
- Post-Flight Inspection
  - Reviewing inspection assets
  - Creating reports
  - Inspecting large amounts of data from multiple sensors
- Questions
- Conclusion

# WORKSHOP INSTRUCTORS

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**Paul Frey**  
**VP of Sales, Sharper Shape**

Paul started as the Director of Electric Utilities with Sharper Shape in 2016 and is now VP of Sales, responsible for helping customers leverage Sharper Shape's unique and exciting technology.

Prior to joining Sharper Shape, Paul was the Senior Manager of Operations at the Edison Electric Institute where he set up their Unmanned Aircraft Systems Executive Task Force, helped establish the National Response Event framework and led the development of the RAMP-UP Tool, a national resource allocation tool for mutual assistance after storms. Paul has over 30 years of engineering and management experience in the utility industry, working at Baltimore Gas & Electric.



**Chris McMurtry**  
**Solutions Architect, Sharper Shape**

In his role as the Solutions Architect for Sharper Shape, Inc., Chris McMurtry is focused on designing unmanned aerial solutions based around the company's class leading "full-stack" hardware and software tools. Chris first became involved with drone technology for film and television production work, but he soon became convinced that unmanned aerial technology could do far more than just produce compelling entertainment content. This led to the creation of one of the first UAS services companies that specialized in using drone technology for utility inspections. Since 2013 Chris has been focused on finding the fit for UAS applications in the energy sector, with the goal of helping utilities transform their inspection and maintenance programs.

## INSTRUCTIONAL METHODS

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Case studies, PowerPoint presentations and classroom exercises will be used in this event.

## REQUIREMENTS FOR SUCCESSFUL COMPLETION

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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

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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 and 0.4 CEUs.**

## EVENT LOCATION

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A room block has been reserved at the Denver Marriott West, 1717 Denver W Drive, Golden, CO 80401, for the nights of October 15-16, 2017. Room rates are US \$169 plus applicable tax. Call **1-303-279-9100** for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is September 17, 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

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

Please make checks payable to: "PMA"

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## PLEASE SELECT

- 2017 UAS FOR ELECTRIC UTILITIES CONFERENCE AND WORKSHOP:** OCTOBER 16-17, 2017: US \$1795  
EARLY BIRD ON OR BEFORE SEPTEMBER 29, 2017: US \$1595
- 2017 UAS FOR ELECTRIC UTILITIES CONFERENCE ONLY**  
OCTOBER 16-17, 2017: US \$1395  
EARLY BIRD ON OR BEFORE SEPTEMBER 29, 2017: US \$1195
- PRE-CONFERENCE WORKSHOP ONLY**  
TUESDAY, OCTOBER 16, 2017: US \$595  
EARLY BIRD ON OR BEFORE SEPTEMBER 29, 2017: US \$495
- I'M SORRY I CANNOT ATTEND, BUT PLEASE EMAIL ME A LINK TO THE CONFERENCE PROCEEDINGS FOR US \$395



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

Print Name Job Title

Company

What name do you prefer on your name badge?

Address

City State/Province Zip/Postal Code Country

Phone Email

List any dietary or accessibility needs here

### CREDIT CARD INFORMATION

Name on Card Billing Address

Account Number Billing City Billing State

Exp. Date Security Code (last 3 digits on the back of Visa and MC or 4 digits on front of AmEx) Billing Zip Code/Postal Code

**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 September 15, 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 course 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 (201) 871-0474.