

A dark red banner with a ribbon-like shape, containing the text 'Conference Agenda' in white.

**Conference Agenda**

# Overhead Lines

Reliability, Security, Restoration, and Safety Considerations  
in Design, Planning, and Asset Management of Overhead Lines

**Transmission 2018**  
**November 27-28 • Tucson, AZ**

# Conference at a Glance

## OVERVIEW

When planning and designing high voltage lines at utilities, engineers must adhere to system standards while considering new technologies and innovative solutions. Once the lines are built, the assets must be carefully managed to ensure affordable and reliable power. Although utility assets are designed to meet certain reliability and safety expectations, they remain vulnerable to extreme events (e.g., wind and ice storms, typhoons, earthquakes, floods, and landslides). Power outages triggered by these events can create service interruptions that may last between a few minutes to several weeks. A carefully orchestrated emergency restoration program can mitigate these situations by reducing the restoration time.

The purpose of this conference is to bring together industry experts on the topics of reliability, security, restoration, and safety, to have them provide insight on how these issues interrelate, and what can be done to improve system performance. In addition to the main assembly, attendees are invited to attend break-out sessions based on their interests, thus providing participants with a focused platform to exchange knowledge and information on new initiatives and recent technological advancements.

## THEMES

### 1 Reliability & Security - Planning

The NERC Reliability Standards are a set of enforceable standards that are in-force, North America wide, across the electricity industry with the purpose of maintaining the reliability of the interconnected electricity system. Considerable effort is required of all participants in the electrical industry to understand, show compliance and keep up-to-date with respect to these standards. The presentations and break-out sessions will highlight and discuss best practices improving reliability and remaining compliant with the NERC Reliability standards, including managing the immense amount of data associated with the power system.

### 2 Asset Management - Managing Transmission Line Reliability and Performance

Several reliability and performance measures are currently available to help utilities determine the effectiveness of their transmission line assets and components. Typically, system reliability is measured using SAIDI, SAIFI, and MAIFI, where line-specific reliability is expressed by the failures or interruptions per unit length; greater granularity is also possible at the component level (e.g. insulator failures based on design and vintage).

The presentations and the break-out session will subsequently highlight and discuss the applications of these measures, in addition to the information needed to manage the reliability of transmission line systems, individual lines, and components. Examples demonstrating the suitability of these measures will be discussed and how they can be applied to manage reliability in various scenarios (e.g. supplying specific customers with power, system redundancy, public safety, line failures, and voltage). Additionally, it is important to recognize that the best performance a transmission line can achieve is the level to which it was designed; if reliability is found to be unacceptable, design enhancements will have to be introduced. In light of this, several low-cost modifications to improve design reliability will also be highlighted, along with a discussion on developing a standardized database to document various information (e.g. online and component failures, outages, causes of failure). The discussions under this theme should subsequently help line designers improve design reliability in the future.

### 3 Reliability, Security & Safety in Line Design

This session will highlight the reliability and security issues in line design for various line components (e.g. structures, foundations, conductors, hardware) etc. In recent years, there have been strong interests in understanding how the aging of components (i.e. degradation) affects the components' reliability as well as the overall system's mechanical performance. Presentations will be sought with respect to reliability improvement of lines, security enhancement with respect to avoiding catastrophic line failures. In addition to highlighting any "knowledge gaps" and their solutions, the current understanding of national and international standards regarding reliability, security, and safety will also be reviewed.

# 4 Emergency Restoration (Catastrophic Failures) - Lines, Network, Issues & Challenges

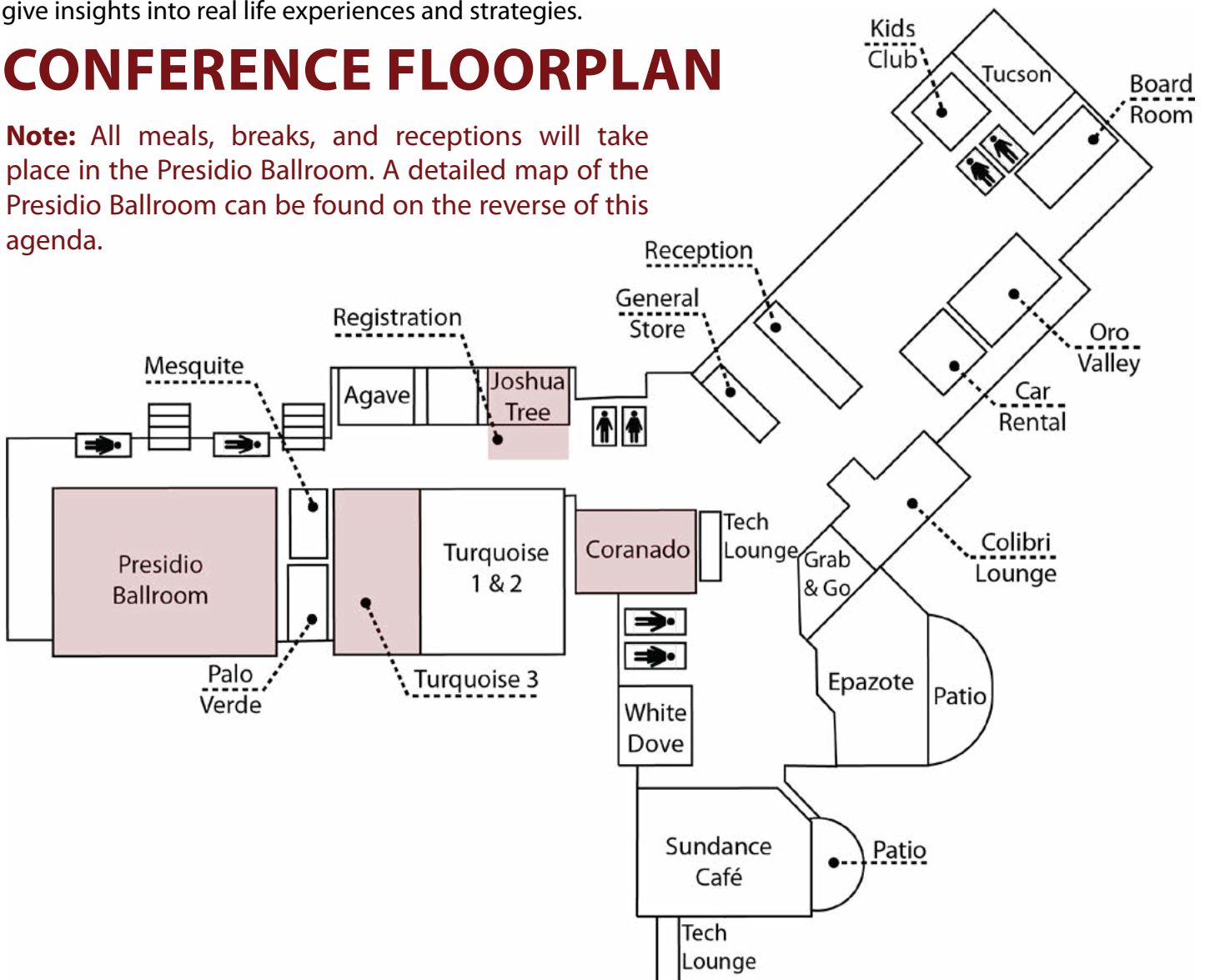
This session will outline how to minimize the impacts of catastrophic overhead line failures from both line design and asset management perspectives by using proactive design considerations and effective emergency restoration response plans.

During line design, anti-cascading structures placed at strategic locations or mechanical fuses can be used to help control cascading failures and severity of damage. Incorporating appropriate extreme loadings with higher return periods for selected critical lines will improve reliability. Also, by specifying materials that are readily available, stocked, and easily replaced with normal crew expertise and equipment, the time from failure to energization can be greatly sped up. And, in special cases, the availability of specially designed emergency restoration structures can be critical to mitigating failures on large lattice towers and other similar structures.

This session will also present an overview of emergency restoration planning and identify what strategies utilities should consider in developing and implementing an effective emergency restoration plan. To prepare for major ice storms or hurricanes, utilities should also consider executing contractual agreements with line contractors that address logistics including standby rates, mobilization, lodging, crew makeup, and equipment needs. The presentations will focus on recently experienced emergency restoration events and give insights into real life experiences and strategies.

## CONFERENCE FLOORPLAN

**Note:** All meals, breaks, and receptions will take place in the Presidio Ballroom. A detailed map of the Presidio Ballroom can be found on the reverse of this agenda.



# Day 1 - Overhead Lines

November 27, 2018

## 7:30-8:30 Registration & Breakfast

8:30-8:40	<b>Opening Remarks &amp; Welcome Address</b>	<i>Asim Haldar, CEATI International</i>
8:40-9:00	<b>Conference Overview &amp; Expected Results</b>	<i>John Sabiston, CEATI International</i>
9:00-10:00	<b>Keynote Speaker for Sessions 1 and 2</b>	<i>Rob Kondziolka, Salt River Project</i>

## 10:00-10:30 Break

### **Session 1: Reliability & Security - Planning**

*John Sabiston, CEATI International (Chair)*

 *Turquoise 3*

10:30-11:00	<b>Automated Cascading Analysis to Comply with NERC Reliability Standards</b>	<i>Marianna Vaiman, V&amp;R Energy</i>
11:00-11:30	<b>Reliability Guideline: BPS-Connected Inverter-Based Resource Performance</b>	<i>Ryan Quint &amp; Rich Bauer, NERC</i>
11:30-12:00	<b>Improved System Integrity and Wide Area Protection</b>	<i>Srijib Mukherjee, UNC Charlotte and Mott MacDonald</i>

## 12:00-1:30 Lunch

### **Session 2: Asset Management - Managing Transmission Line**

**Reliability & Performance**

*George Watt, CEATI International (Chair)*

 *Turquoise 3*

1:30-2:00	<b>Transmission Line Asset Management at Salt River Project</b>	<i>Yancy Gill &amp; Daryl Chipman, Salt River Project</i>
2:00-2:30	<b>Improving the Reliability of Transmission Structures' Refurbishment Using Intelligent System</b>	<i>Ibrahim Hathout, Hydro One</i>
2:30-3:00	<b>Condition Assessment of Porcelain and Toughened Glass Cap and Pin Insulators</b>	<i>Christian Bonilla, BC Hydro / Powertech Labs</i>

## 3:00-3:30 Break

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# Day 1 - Overhead Lines

November 27, 2018

## Day 1 Breakout Sessions

### Session 1: Reliability & Security - Planning

John Sabiston, CEATI International (Chair)

Coronado

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| 3:30-3:45 | <b>Fault Induced Delayed Voltage Recovery (FIDVR)</b><br>Sarina Adhikari, EnerNex                       |
| 3:45-4:15 | <b>Technologies and Policies for Grid Reliability &amp; Resilience</b><br>Henry Chao, Quanta Technology |
| 4:15-5:00 | <b>Discussion</b>   |

### Session 2: Asset Management - Managing Transmission Line Reliability & Performance

George Watt, CEATI International (Chair)

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| 3:30-3:45 | <b>Extreme Icing Events - Simulations in the Office, Reliability in the Field</b><br>Jason Wowryk, Manitoba Hydro International |
| 3:45-3:55 | <b>CEA Equipment Reliability Information System (ERIS) Program</b><br>Pat Manor, Altalink                                       |
| 3:55-4:05 | <b>Reliability &amp; Asset Management; A Risk Management Model</b><br>Boris Andino, Pacific Gas & Electric                      |
| 4:05-5:00 | <b>Discussion</b>   |

5:00-7:00 Reception

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# Day 2 - Overhead Lines

November 28, 2018

## 7:30-8:30 Breakfast

8:30-8:45	<b>Morning Announcements</b>	George Watt, CEATI International
8:45-9:30	<b>Understanding Reliability, Security, and Safety in Line Design</b>	Asim Haldar, CEATI International
9:30-10:00	<b>Puerto Rico Power Restoration Efforts</b>	Mireya Rodríguez-Fernández & Juan Carlos Miranda, Puerto Rico Electric Power Authority

## 10:00-10:30 Break

### Session 3: Reliability, Security & Safety in Line Design

Asim Haldar, CEATI International (Chair)

 Turquoise 3

10:30-11:00	<b>Transmission Line Failure Propagation, Industry Review</b>	Leon Kempner, Bonneville Power Administration
11:00-11:30	<b>Transmission Lines under Tornadoes and Downbursts - Numerical Simulation, Testing and Code Implementation</b>	Dr. Ashraf El Damatty, University of Western Ontario
11:30-12:00	<b>Uncertainties in Geotechnical Aspects of Foundation Design of Overhead Lines</b>	Peter Kandaridis & Ashley Evans, DiGioia Gray

## 12:00-1:15 Lunch

### Session 4: Emergency Restoration (Catastrophic Failures) - Lines, Network, Issues & Challenges

Prasad Yenumula & Dan Chapoton, Duke Energy (Chairs)

 Turquoise 3

1:15-1:40	<b>The Value and Challenges of Designing New Transmission Lines for Restoration Activities</b>	Brian Townsend, Altalink
1:40-2:05	<b>Emergency Resource and Restoration Planning for Overhead Transmission Line Asset Owners</b>	Dr. Keith E. Lindsey, Lindsey Manufacturing Co.
2:05-2:30	<b>Challenges Around Steel Pole Supply and Delivery During Storms from the Vendor Perspective</b>	Brandon Hammons, Meyer Utility Structures

## 2:30-2:50 Break

2:45

### Prize Draw

All winners must be present to be eligible.

 Presidio Ballroom

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# Day 2 - Overhead Lines

## November 28, 2018

### Day 2 Breakout Sessions

#### Session 3: Reliability, Security & Safety in Line Design

Asim Haldar, CEATI International (Chairs)

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| 3:00-3:10 | <b>Economic Reliability Design for Drilled Pier Foundations</b><br><i>Greg Parent, Ulteig</i>   |
| 3:10-3:20 | <b>ESB Experience with Implementation and Application of CENELEC Standard (EN 50341-1:2012) – Overhead Electrical Lines Exceeding AC 1 kV</b><br><i>Brian Gallagher, ESBI</i> |
| 3:20-3:30 | <b>Mechanical Fuse &amp; Line Security</b><br><i>Paul Ibanez, ANCO Engineers</i>  |
| 3:30-4:30 | <b>Discussion</b>   |

#### Session 4: Emergency Restoration (Catastrophic Failures) - Lines, Network, Issues & Challenges

Prasad Yenumula & Dan Chapoton, Duke Energy (Chairs)


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| 3:00-3:20 | <b>ComEd Tornado Restoration Experience</b><br><i>Daniel Brotzman, ComEd</i>                           |
| 3:20-3:40 | <b>Storm Planning &amp; Preparation at Southern Company</b><br><i>Wade Craighead, Southern Company</i> |
| 3:40-4:30 | <b>Discussion</b>  |

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| 4:30-5:10 | <b>Results from the Breakout Sessions</b> | <i>Session Chairs</i>                          |
| 5:10-5:20 | <b>Vote of Thanks</b>                     | <i>Andrew Barrett,<br/>CEATI International</i> |
| 5:20-5:30 | <b>Closing Remarks</b>                    | <i>Asim Haldar,<br/>CEATI International</i>    |

#### 6:30 The CEATI Women in Power Group's Networking Reception

Facilitator: Shelly Feltmate, New Brunswick Power

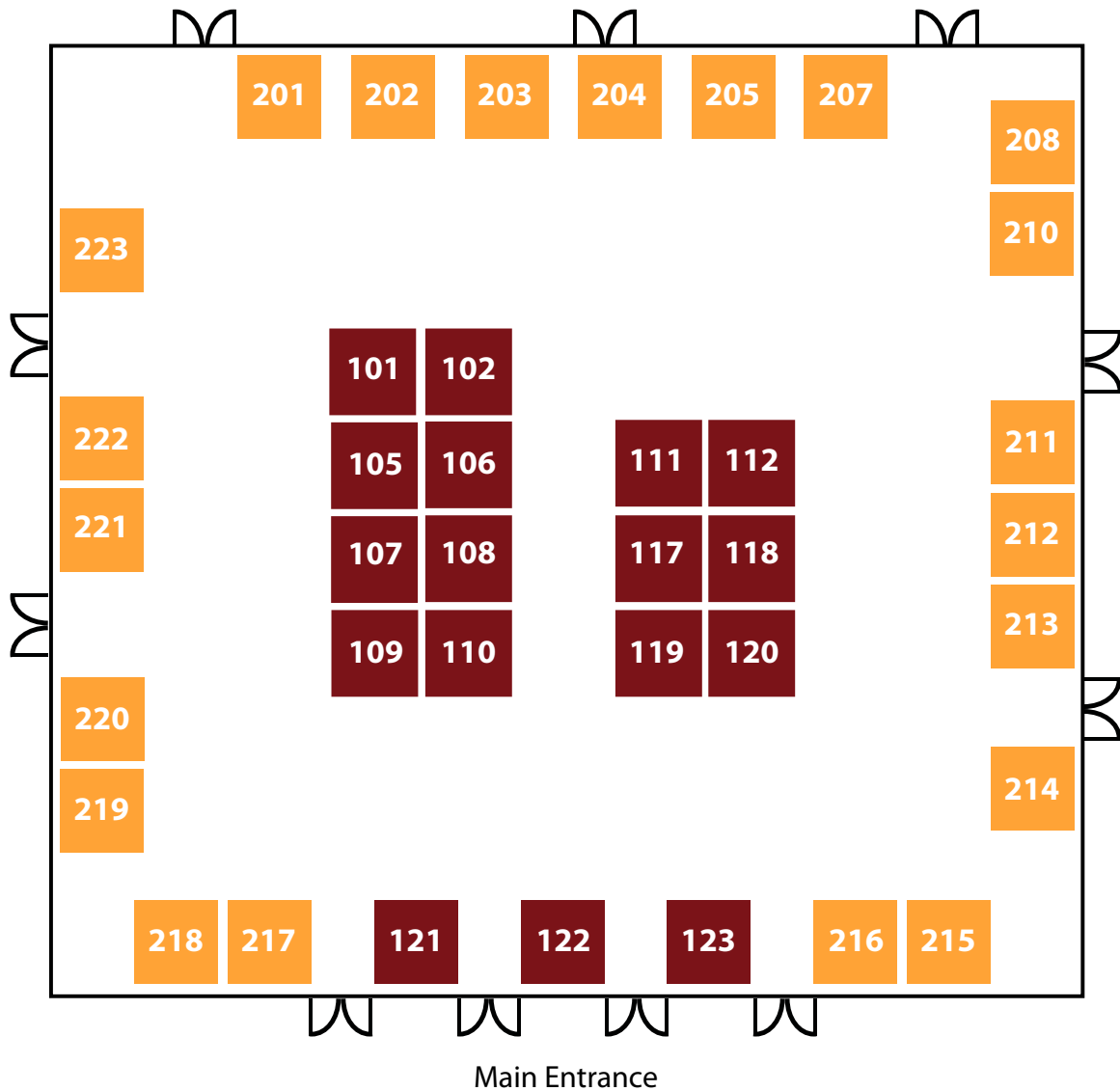
 Joshua Tree

Panelists: Patti Metro, National Rural Electric Cooperative Association  
Mehrnoosh Janbakhsh, Saskatoon Light & Power  
Liz Palmera-Nunez, Newfoundland Power

Join at us at the Women in Power Group's Networking Reception. Appetizers will be served and drinks will be available for purchase. Everyone is welcome to register and partake. Interested parties should email [wip@ceati.com](mailto:wip@ceati.com)

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# Presidio Ballroom: Exhibitors



Advanced Test Equipment Rentals (220)

Ampacimon Inc. (203)

AP Sensing (201)

Borealis Compounds (218)

**CableQ (108)**

CEATI International (106)

Classic Connectors USA (202)

Copperleaf (214)

DiGioia Gray (223)

EA Technology (222)

EDM International & INTEC Services (216)

EJ USA (212)

Exacter Inc. (221)

**FDH Infrastructure Services (101)**

**Galvatech2000 (112)**

Hanson Professional Services (205)

**IPS Energy (107)**

**Kinectrics (117)**

Lindsey Manufacturing Company (208)

**LineVision (111)**

Linewise Aerial (213)

Manitoba Hydro

International (204)

**METSCO Energy Solutions (109)**

Nexans High Voltage (210)

**Novinium (121)**

**Onstream Pipeline Inspection (123)**

Osмосе Utilities Services (219)

**Powertech Labs (105)**

Preformed Line Products (215)

Public Utilities Maintenance (207)

**SAE (102)**

**SEDIVER (120)**

Southwire (217)

**Sterblue (118)**

Tetra Tech (211)

**Tower Power (110)**

**W.A. Chester (122)**

**WIKА Instrument (119)**