

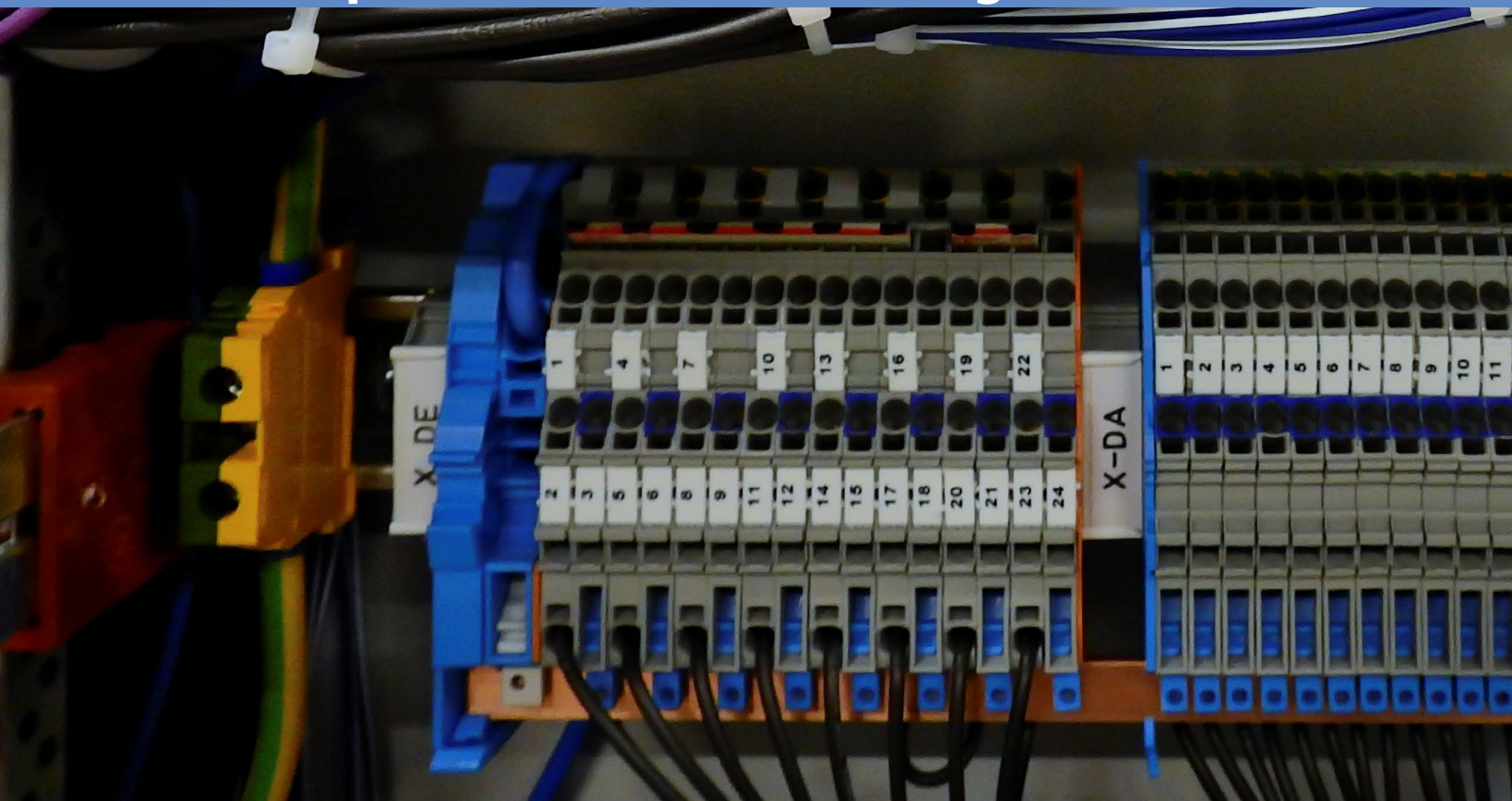


**6<sup>th</sup> Annual**

# Protection and Control

Enhancing Electric Network Resiliency and  
Efficiency through Modernization of Protection  
and Control Systems

**April 9-10, 2019 • Los Angeles, CA**



# Conference at a Glance

## OVERVIEW

The 6th Annual Protection and Control Conference will encompass several areas identified by members of the CEATI Protection and Control Program. The conference themes focus on innovative protection system design and maintenance; application and management of modern digital protection relays; management and advanced analytics of large information databases; enhanced integration of DGs and microgrids (specifically in relation to the revised IEEE 1547 standard); new protection, control and communication technologies; and topics related to hydroelectric generation protection and control technologies.

## THEMES

### **1 Innovative Approaches for Optimizing Protection System Design, Maintenance, and Replacement Strategies**

- Systems design standards/guidelines and recognized best practices for transmission and distribution stations protection and control– e.g. development of modular protection design standards
- Applications of the IEC 61850 protocol in the design of new substations, and training requirements for utility staff involved in the design, commissioning, and maintenance of such facilities
- Experiences from the application of IEC 61850 standards, including GE Process Bus and BRICS modules, in substation design and operation
- Optimization of protection system relay replacement strategies, including relay data management systems
- Best practices in protection systems maintenance and data management supporting audits for compliance with NERC reliability standards
- Cyber-security – standards, guidelines, and best practices in managing risks from cyber attacks
- Management and analytic processes of large volumes of data, including automated analyses and evaluation of protection responses to system faults
- Using SCADA in combination with digital protection relays capabilities for station automation

### **2 Enhanced Utilization of Modern Digital Relay Capabilities for Station Automation and “Smart Grid” Applications**

- Detecting irregular performance of power system elements, including breaker restrikes, harmonics-caused resonant conditions, and GICs and power transformer saturation conditions
- Detection and recognition of waveform signatures for identifying incipient system faults and their locations
- Digital relay logic programming capabilities, for initiating appropriate control actions to minimize power outages and/or facilitate automation of network operations
- Use of smart meter data in conjunction with information from digital relays for improvements in locating permanent, transient, and high-impedance faults in distribution systems
- Use of digital relays for SCADA RTU function



### **3 Technologies and Techniques for Improved Integration of Distributed Generators and Microgrids**

- Emerging power system protection and control issues caused by inertia-less, intermittent generators
- Potential changes in power system dynamic characteristics, impact on conventional generator control systems responses, and requirements for optimal coordination with DG controls
- Novel technologies capable of introducing “synthetic inertia” into power system; their technical characteristics and uses for power system stability enhancements
- Application and means of coordination of smart inverters to facilitate improved voltage and frequency regulation and mitigation of power swings
- Technologies and techniques for enabling autonomous operation of microgrids during transient system events and their seamless re-synchronization with the main grid upon its stabilization
- Economic impacts of high levels of DG penetration upon distribution or bulk power system operation, and possible mitigation solutions, including application of energy storage systems

### **4 New Power System Protection, Control, and Communication Systems Technologies**

- Methods for accurate location system faults, including high-impedance faults
- Identifying and locating major system performance issues and possible automation of switching required to mitigate system impact
- Technologies designed to improve system security, such as new wide-area monitoring schemes, synchrophasor measurements and their applications, near-real-time power system computer modeling and state estimation techniques, and new methods for power system simulation and protection coordination verification.
- Technologies that increase the level of power system automation and enhance electric supply power quality
- Technologies and methodologies that reduce the overall power system capital investment and operating costs

### **5 New and Emerging Protection and Control Technologies for Hydroelectric Power Generators**

- Design standards/guidelines and recognized best practices for generator protection and control systems
- Protection philosophies and technologies for minimizing arc flash energy in the station’s main generator and auxiliary service switchgear
- Generator fault analysis and case studies
- Modeling of generator controls for coordinating generator and/or transmission system protection relaying, including schemes designed for ensuring power system integrity during major disturbances
- Model validation techniques and methodologies for generator governor and excitation systems
- Aging technology, including reliability, adequacy of existing protection, and control schemes, end of life determination, and best practices in development of business cases for optimal improvements
- New generator ground fault detection schemes ensuring reliable 100% zone coverage
- Techniques, experiences and best practices in remote generation plant monitoring and operations
- Protection and controls issues arising from increased participation of intermittent, inverter-based generators in power system energy generation and active voltage and frequency controls
- Requirements for effective coordination and performance monitoring/verification of all generator control systems

# Protection & Control

Day 1 - April 9, 2019

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

### *Session 1: Innovative Approaches for Optimizing Protection System Design, Maintenance, & Replacement Strategies*

 California 1&2

8:30-9:00	<b>How the Engineering Design Process Can Simplify the Testing of Automation and Control Systems</b>	<i>Eugenio Carvalheira, OMICRON</i>
9:00-9:30	<b>Best Practices for Developing and Implementing a New Protection Design Standard</b>	<i>Scott Hayes, Pacific Gas &amp; Electric</i>
9:30-10:00	<b>Session Presentation</b>	<i>To be confirmed</i>

## 10:00-10:30 Break

10:30-11:00	<b>Automated Approach for Compliance with PRC-027-1 Requirements for Protection System Coordination of BES Elements</b>	<i>Saman Alaeddini, Quanta Technology</i>
11:00-11:30	<b>Session Presentation</b>	<i>Ali Kazemi, Schweitzer Engineering Laboratories</i>
11:30-12:00	<b>Maximizing LiDAR to Validate Protection Models</b>	<i>Baldwin Yeung, CMYSolutions</i>

## 12:00-1:30 Lunch

### *Session 2: Enhanced Utilization of Modern Digital Relay Capabilities for Smart Grid Applications*

 California 1&2

1:30-2:00	<b>Using SCADA in Combination with Digital Protection Relays Capabilities for Station Automation</b>	<i>Vitaliy Mykhaylychenko, Hydro One</i>
2:00-2:30	<b>How Stand-Alone Merging Units Can Pave the Way Towards More Digital Substations and IEC61850 Protection Schemes Meanwhile Leveraging Existing Measuring Assets</b>	<i>Vincent Balvet, Vizimax</i>
2:30-3:00	<b>Digital Substations: A Journey...Not a Destination</b>	<i>Dustin Tessier, TESCO</i>

## 3:00-3:30 Break

*Agenda is subject to change without notice.*

# Protection & Control

April 9, 2019 - Day 1

*Session 3: Technologies and Techniques for Improved Integration of Distributed Generators and Microgrids*

📍 California 1&2

3:30-4:00 **How New Controlled Switching Techniques Permit Rethinking Power Quality, Protection and Maintenance Schemes in Today's Medium and High Voltage Power Systems**

Vincent Balvet,  
Vizimax

4:00-4:30 **Simultaneous Voltage and Phase Control for Inverter-based Distributed Generation Through Synthetic Inertia**

Shahab Mehraeen,  
Louisiana State University

4:30-5:00 **DNP3 Profile for DER Interconnections**

Grant Gilchrist,  
TESCO

5:00-7:00 Reception

THANK YOU TO OUR MEMBERS



Agenda is subject to change without notice.

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# Protection & Control

Day 2 - April 10, 2019

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

### Session 4: New Power System Protection, Control, and Communication Systems Technologies

 California 1&2

8:30-9:00	<b>Teleprotection with MPLS Ethernet Communications: Development and Testing of Practical Installations</b>	<i>Michael Bryson, Schweitzer Engineering Laboratories &amp; Tariq Rahman, San Diego Gas &amp; Electric</i>
9:00-9:30	<b>Travelling Wave Measurements for Detection of Transmission Line Incipient Faults</b>	<i>Bogdan Kasztenny, Schweitzer Engineering Laboratories</i>
9:30-10:00	<b>The Ground Fault Neutralizer: Smart Bushfire Protection for Australia</b>	<i>Klaus Winter, Swedish Neutral Holding AB</i>
<b>10:00-10:30 Break</b>		
10:30-11:00	<b>Improving DC Circuit Breaker Performance Through an Alternate Commutating Circuit</b>	<i>Shahab Mehraeen, Louisiana State University</i>
11:00-11:30	<b>DeltaVAR Paralleling</b>	<i>Wayne Hartmann, Beckwith Electric</i>
11:30-12:00	<b>Power System Protection Emulation in EMTP</b>	<i>Mehrdad Rostami, Stantec</i>

## 12:00-1:30 Lunch

## 1:00-3:00 Breakout Sessions 5A & 5B

### Session 5A: New Ways of Using Power System Data for Enhanced Operational Efficiency and Power Quality Improvement

 California 1

1:00-1:30	<b>Detecting High Impedance Faults on Overhead Distribution Systems</b> <i>Wilsun Xu, Electric Power Solutions</i>
1:30-2:00	<b>Automatic Data Analysis and Visualization of Digital Substation Events</b> <i>Yujie Yin, Quanta Technology</i>
2:00-2:30	<b>Automatic Disturbance Data Collection and IED Management</b> <i>Sterin Jose, ASE / Kalkitech</i>
2:30-3:00	<b>Enhancing Connectivity of DGs by Control Coordination of Smart Inverters</b> <i>Rajiv Varma, SMG Power Consultants</i>

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# Protection & Control

Day 2 - April 10, 2019

## Session 5B: New and Emerging Protection and Control Technologies for Hydroelectric Power Generators

 California 2

- |           |  |
|-----------|--|
| 1:00-1:30 | <b>Automatic Combination (CAM) Curve Optimizing System for Kaplan and Bulb Turbines</b><br><i>Alessandro Quadrelli, Enel Green Power</i>                           |
| 1:30-2:00 | <b>Control Systems Integration for Unmanned Operation of Remote Small Hydro</b><br><i>Fon Hiew, New Brunswick Power</i>  |
| 2:00-2:30 | <b>Stator Ground Protection for Multiple High-Impedance Grounded Generators Sharing a Common Bus</b><br><i>Ritwik Chowdur, Schweitzer Engineering Laboratories</i> |
| 2:30-3:00 | <b>Session Presentation</b><br><i>To be confirmed</i>  |

3:00-3:30 Break

3:30-4:45 Breakout Sessions 5A & 5B

## Session 5A: New Ways of Using Power System Data for Enhanced Operational Efficiency and Power Quality Improvement (cont.)

 California 1

- |           |  |
|-----------|--|
| 3:30-4:00 | <b>Micro-Synchrophasors and Thumping: A New Technology for Understanding Grid Stability</b><br><i>Alex McEachern, McEachern Laboratories</i> |
| 4:00-4:30 | <b>Surge Protection and Power Protections</b><br><i>Ghassan Nasrallah, Eaton</i>   |
| 4:30-4:45 | <b>Concluding Remarks</b><br><i>Dennis Hansen, CEATI International</i>   |

## Session 5B: New and Emerging Protection and Control Technologies for Hydroelectric Power Generators (cont.)

 California 2

- |           |  |
|-----------|--|
| 3:30-4:00 | <b>Session Presentation</b><br><i>To be confirmed</i>                |
| 4:00-4:30 | <b>Session Presentation</b><br><i>To be confirmed</i>                |
| 4:30-4:45 | <b>Concluding Remarks</b><br><i>Jerry Lepka, CEATI International</i> |

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6<sup>th</sup> Annual

# Protection & Control Conference 2019

April 9-10, 2019 • Los Angeles, CA

## Registration Form

You can also register online at [www.ceati.com/PC2019](http://www.ceati.com/PC2019)

### Your Information

Name

Title

Organization

Street Address

City, Province, State

Country

Postal/Zip Code


E-mail

Phone

Fax

### Payment Information

Visa 

Mastercard 

Card No.

Expiry Date  /

Signature

Cardholder

**DoubleTree Los Angeles Downtown**  
120 South Los Angeles Street  
Los Angeles, CA, 90012  
+1-213-629-1200



### Registration Fees & Discounts

Register by January 15<sup>th</sup>, 2019 and save up to \$100

- \$1195 USD Standard Pass
- \$995 USD Utility Pass
- \$755 USD CEATI Participant Pass
- \$755 USD Speakers

\*P&C Program participating organizations may be eligible for a complimentary registration - contact your Program Coordinator for more information.

### Exhibit at the Protection and Control Conference!

- \$3500 USD Sponsorship Booth (2 passes)
  - \$2700 USD Standard Booth (2 passes)
  - \$1500 USD Conference Sponsor
  - \$755 USD Additional Exhibitor Passes
- Quantity: \_\_\_\_\_

Please indicate your top 3 booth choices below:

**For Exhibitors:** All cancellations received 60 days prior to the event will be subject to a processing fee of 25% of the total amount. There will be no refunds granted after this date. Delegate substitution is permitted at no extra cost. Exhibitor registration and additional conference passes include proceedings package, access to the presentation room, breakfast, breaks, lunches, and reception where indicated on the schedule.

### Important Information

Registration fees include proceedings package, breakfast, breaks, lunches and reception where indicated on the schedule.

Please check if you wish to be contacted about allergies or other dietary requirements.

Prices are in USD. Charges will appear as 'CEATI International Inc' and are subject to applicable taxes and fees. All cancellations received at least 60 days prior to event will be subject to a \$200 processing fee. There will be no refunds granted after this date. Delegate substitution is permitted at no extra cost. Please note that all names registering for the event will be added to CEATI's mailing list. If you do not wish to be included in this electronic outreach, please click on the 'unsubscribe' button in the email to remove yourself. In the spirit of industry networking, your email may be shared with other conference participants. If you do not wish to have your email shared, please contact us at [events@ceati.com](mailto:events@ceati.com). By attending, you acknowledge that there may be photographs or videos taken of you during this event, and you consent to the use of these photographs or videos in future CEATI communications.

All conference guests are eligible for a preferred rate of \$178 USD a night, subject to availability. To receive the preferred rate, please mention the special convention rate for the CEATI Protection and Control Conference. The preferred rate is only available until March 1st, 2019.

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