



# Grid of the Future™



## Raleigh, NC

# 2024

## November 11-14



**QUANTA**  
TECHNOLOGY

**MONDAY, NOVEMBER 11**  
\*TECHNICAL PROGRAM OPENS AT 7:45AM\*

*\*Rows highlighted in green indicate events taking place at the Sheraton Hotel, the secondary conference location\**

| Time            | Event   | Speakers  | Location                                      |
|-----------------|---|---|---|
| 7:00AM - 5:00PM | CIGRE - Registration/Badge Pickup   |   | Raleigh Convention Center<br>North Main Lobby |
| 1:00 - 4:30PM   | Next Generation Network (NGN) Workshop<br>Bright Spots and Blind Spots: Exploring the Potentials of Emerging Technologies | Dr. Poorvi Patel - <i>EPRI</i><br>Dr. Cynthia Selin - <i>Scenaric</i> | Raleigh Convention Center<br>Room 305AB       |
| 4:45 - 5:30PM   | CIGRE NGN Mentorship Program  |   | <i>Invitation Only</i>                        |
| 6:30 - 7:30PM   | Empowering Girls in STEM  | CIGRE Women in Energy (WIE)   | <i>Invitation Only</i>                        |
| 5:30 - 7:30PM   | Welcome Reception Sponsored by Siemens Energy   |   | Raleigh Convention Center<br>North Hallway    |

# TUESDAY, NOVEMBER 12

**\*TECHNICAL PROGRAM OPENS AT 7:45AM\***

| Time   | Event   | Speakers  | Location                                      |
|--|---|---|---|
| 7:00AM - 5:30PM  | CIGRE - Registration/Badge Pickup<br><i>*Breakfast is on your own unless you've signed up for the Women in Energy Breakfast event*</i>                              |   | Raleigh Convention Center<br>North Main Lobby |
| 6:45 - 7:35AM  | Women in Energy (WiE) Breakfast Sponsored by Mitsubishi Electric Power Products, Inc.   | Majida Malki - <i>Quanta Technology</i>   | Sheraton Hotel<br>Hannover Ballroom           |
| 7:45 - 8:15AM  | Welcome Address & Keynote Address   | Chris Root - <i>CIGRE USNC</i><br>Damir Novosel - <i>Quanta Technology</i>  | Raleigh Convention Center<br>Ballroom C       |
| 8:15 - 9:15AM  | CIGRE Panel Session:<br>Changing Electrical System - Aspirations vs. Reality  | <b>Moderator:</b><br>Damir Novosel - <i>Quanta Technology</i><br><b>Panelists:</b><br>Aftab Khan - <i>PJM Interconnection</i><br>Joe Woomeer - <i>Dominion Energy</i><br>Shay Bahramirad - <i>PG&amp;E</i><br>Ernst Scholtz - <i>S&amp;C Electric</i> | Raleigh Convention Center<br>Ballroom C       |
| 9:15 - 9:30AM  | Morning Break   |   | Raleigh Convention Center North Hallway       |
| 9:30 - 11:00AM   | <b>Paper Session 1A</b>   | <b>Authors</b>  | Raleigh Convention Center<br>Room 305A        |
|  | <i>System-Wide Dynamic Protection Settings for Transmission Systems</i>   | <b>K. Judd - Quanta Technology</b> , M. Malki, E. Carpenter, S. Karki, P. Wang  |   |
|  | <i>A Review on Protection Challenges of Transmission Lines Connected to Inverter-Based Resources</i>  | <b>I. Zaman - Quanta Technology</b> , O. Alizadeh, Y. Lin, A. Zamani, M. Jensen, A. Saeed   |   |
|  | <i>Transmission Line Protection Under High Penetration of Inverter-Based Resources: Impact Assessments and Mitigation Solutions</i>                                 | <b>J. Holbach - Quanta Technology</b> , H. Chao, Z. Cheng, Y. Hu, P. Haswell, L. E. Seiter, C. T. Hitchings, A. O'Leary, H. Hooshyar, T. Nguyen, M. Razanousky  |   |
| <i>Bridging the Gap Between Protection and Planning for Holistic Analysis of Transmission System Performance</i> | <b>S. Alaeddini - Quanta-Technology</b> , I. Anand, B. Varughese, J. Velez, M. Chapariha, G. Webster  |   |   |
| 9:30 - 11:00AM   | <b>Paper Session 1B</b>   | <b>Authors</b>  | Raleigh Convention Center<br>Room 305B        |
|  | <i>Extreme Fast Charging: Overview of Technology and Grid Impacts, and Importance of Lab Testing to Mitigate Potential Issues and Enable Large-Scale Deployment</i> | <b>M. Lelic - Quanta Technology</b> , I. Zaman, H. Teimourzadeh, A. Momeni, N. Kouchakipour, A. Jain, C. Botero, R. Kothandaraman   |   |
|  | <i>Managing High-Demand EV Fast Charging through Smart Charging and Energy Storage Integration: A SCE Case Study Demonstration</i>                                  | <b>E. Kellogg - Southern California Edison</b> , R. A. Kwan, R. Miller, F. Elyasichamazkoti, E. Wang, J. Kruger, N. Kouchakipour  |   |
|  | <i>Vehicle-to-Grid Optimization via Quantum Annealing</i>   | <b>T. Christeson - University of Denver</b> , A. Khodaei  |   |
| <i>State of the Art in Application of Multi-Port DC-DC Converter to EVs</i>                                      | <b>R. Bahrami - The University of Tulsa</b> , K. Ashenayi   |   |   |

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| Time              | Event  | Speakers  | Location                                |
|-------------------|--|---|---|
| 9:30 - 11:00AM    | <b>Paper Session 1C</b>  | <b>Authors</b>  | Raleigh Convention Center<br>Room 306A  |
|                   | <i>Transient Stability Assessment of Utility-Scale System with Grid-Forming Battery Storage</i>                                      | L. Lederman - Electric Power Research Institute (EPRI), D. Ramasubramanian, M. Holmberg |   |
|                   | <i>Impact of Large Load Disconnection on System Stability</i>  | P. Mitra - Electric Power Research Institute (EPRI), L. Sundaresh                       |   |
|                   | <i>Building LLM-Powered Agent to Augment Quality Control in Reliability Planning of Distribution Grid</i>                            | M. Zhuang - Quanta Technology, A. Sadikovic, A. Chandel, K. Whelan                      |   |
|                   | <i>Utilizing Bi-Directional Distribution Level Power Flow Studies to Illustrate Effects of DER on the Electric Distribution Grid</i> | S. Ezraseneh - Consolidated Edison Company of New York, Inc., A. Field                  |   |
| 9:30 - 11:00AM    | <b>Paper Session 1D</b>  | <b>Authors</b>  | Raleigh Convention Center<br>Room 306B  |
|                   | <i>Enhancing Power Flow Management in a New England System with High IBRs Using m-SSSC and PST Integration</i>                       | A. Al-Homsi - Smart Wires, S. Rozon, H. Presume, J. Carrara                             |   |
|                   | <i>Practical Applications of Near-Instantaneous Bi-Directional Power Flow</i>  | J.-M. Dubois - POWER Engineers, Inc., R. MacNeill                                       |   |
|                   | <i>Practicality of Superconductors in Power Transmission</i>   | K. Cole - POWER Engineers, Inc.   |   |
|                   | <i>Beyond the Surface: The Strategic Advantages and Growing Need for Submarine Power Cables</i>                                      | S. Ho - Burns & McDonnell   |   |
| 9:30 - 11:00AM    | <b>Paper Session 1E</b>  | <b>Authors</b>  | Raleigh Convention Center<br>Room 306C  |
|                   | <i>Failover Redundancy Mechanism Ensuring Hitless Communications for Line Differential Protection</i>                                | M. Subieta - Nokia, E. Santin, H. Chan, R. Wright                                       |   |
|                   | <i>Demonstrating Segment Routing Potential for Utility IP/MPLS Networks</i>  | A. Silvius - Burns & McDonnell  |   |
|                   | <i>Distribution Workforce of the Future: Needs and Solutions</i>   | G. Johnson - Dominion Energy, J. R. Aguero, D. Hall, H. L. Willis                       |   |
|                   | <i>Accelerated FLISR Rollout to Improve Company Reliability</i>  | L. Townsend - National Grid, Z. J. Garnes   |   |
| 11:00 - 11:15AM   | Transitional Break   |   |   |
| 11:15AM - 12:30PM | Grab and Go Boxed Lunch  |   | Sheraton Hotel<br>Hannover Ballroom     |
| 11:15AM - 12:30PM | CIGRE USNC Executive Committee Lunch   | Chris Root - CIGRE USNC   | Raleigh Convention Center<br>Room 201   |
| 12:30 - 12:45PM   | Transitional Break   |   |   |
| 12:45 - 2:15PM    | CIGRE NGN Paper Competition  | Jodie Lupton - Salt River Project   | Raleigh Convention Center<br>Ballroom C |
| 2:15 - 2:30PM     | Afternoon Break  |   | Raleigh Convention Center North Hallway |

# TUESDAY, NOVEMBER 12

\*TECHNICAL PROGRAM OPENS AT 7:45AM\*

| Time           | Event  | Speakers   | Location                               |
|----------------|--|--|--|
| 2:30 – 4:00 PM | <b>Paper Session 2A</b>  | <b>Authors</b>   | Raleigh Convention Center<br>Room 305A |
|                | <i>Bulk Power System Dynamic Contingency Manager - Chilean Grid Case Study</i>   | <b>W. O. Bojorquez - SPLIGHT North America</b> , C. Caldard, A. Hoese  |  |
|                | <i>Comparison of Different Line Models for Switching Overvoltages Simulations</i>  | <b>Z. Wang - GE Vernova</b> , P. Wang, R. Zhang  |  |
|                | <i>Identification of Impact Regions for Adaptive Distribution System Modeling in Transmission-Level Dynamic Contingency Analysis</i>     | <b>Q. Huang - Colorado School of Mines</b> , O. Cornmesser   |  |
|                | <i>Regional Grid Inertia Estimation and Frequency Nadir Prediction Considering Renewable's Fast Frequency Response</i>                   | <b>L. Zhu - Electric Power Research Institute (EPRI)</b> , M. Elnasry, E. Farantatos, C. Zhang, D. Ramasubramanian, P. Mitra, V. Singhvi                 |  |
| 2:30 – 4:00PM  | <b>Paper Session 2B</b>  | <b>Authors</b>   | Raleigh Convention Center<br>Room 305B |
|                | <i>Reverse Power Flow in Transformers</i>  | <b>H. Sanchez-Reategui - Alectra Utilities Corporation</b> , M. D. N. Dang, M. Alimardani  |  |
|                | <i>Application of Probabilistic Bayesian Networks on Transformer Condition Assessment</i>  | <b>L. Cheim - Hitachi Energy</b> , A. Sbravati, K. Mani  |  |
|                | <i>Evaluating the Impact of Multiple DER Aggregators on Wholesale Energy Markets: A Hybrid Mean Field Approach</i>                       | <b>A. L. Liu - Purdue University</b> , J. He   |  |
|                | <i>Visions and Challenges for DER Participation in Electric Markets: A Distribution Perspective</i>                                      | <b>S. Thompson - POWER Engineers, Inc.</b> , J. Mast, J. Burger, J. Lupton   |  |
| 2:30 – 4:00PM  | <b>Paper Session 2C</b>  | <b>Authors</b>   | Raleigh Convention Center<br>Room 306A |
|                | <i>Seasonal Overload Mitigation in Rural Distribution Feeders using Mobile Energy Storage System</i>                                     | <b>F. Katiraei - Quanta Technology</b> , M. Medeiros, M. V. Tol, C. Pang, M. Awadallah, K. Ramachandran, S. Morovati, S. Chuangpishit                    |  |
|                | <i>Hosting Capacity Enhancement Strategies Using Data Analytics &amp; Automation</i>   | <b>L. Tao - Commonwealth Edison</b> , E. Farquharson, W. Nation, S. Pandey   |  |
|                | <i>Comparative Analysis of IBR Voltage Control for DER Hosting Capacity</i>  | <b>A. Sproul - RLC Engineering</b> , M. Hanestad, J. Elwell, A. Musavi, J. Geary, T. Stanley   |  |
|                | <i>Optimal Collector System Configuration for Utility-Scale Renewable Energy Projects</i>  | <b>G. Wollam - Quanta Technology</b>   |  |
| 2:30 – 4:00PM  | <b>Paper Session 2D</b>  | <b>Authors</b>   | Raleigh Convention Center<br>Room 306B |
|                | <i>Practical Time Synchronization Design for Substations</i>   | <b>G. Kaur - Quanta Technology</b> , S. Narayanan, R. Hunt   |  |
|                | <i>Implementation of the Automated Relay Testing and Management Solution: Application and Use Cases</i>                                  | <b>J. Sykes - Quanta Technology &amp; W. Wang - Hydro One Network Inc.</b> , J. Wagner, H. Khani, H. Hujan   |  |
|                | <i>Criteria and Evaluation for an Event Record Retrieval System</i>  | <b>M. B. Gani - Quanta Technology</b> , R. Hunt  |  |
|                | <i>Benefits and Recommendations for Using Classic Protection Functions in Transmission Lines Interfacing IBRs Compliant to IEEE 2800</i> | <b>P. Pinheiro - University of Idaho</b> , S. Chakraborty, R. Bainy, H. Lei, B. K. Johnson, A. Alomari, S. Manson, J. Wang, R. Mahmud, A. Hoke, C. Kruse |  |
| 2:30 – 4:00PM  | <b>Paper Session 2E</b>  | <b>Authors</b>   | Raleigh Convention Center<br>Room 306C |
|                | <i>Solving the Unit Commitment Problem Utilizing a Hybrid Quantum-Classical Computing Method</i>   | <b>T. Christeson - University of Denver</b> , A. Khodaei   |  |
|                | <i>Transmission System Impact Evaluation and Mitigation Method for Public Safety Power Shutoffs</i>                                      | <b>Y. Gao - Quanta Technology</b> , A. Daneshpooy, S. Szydluk, R. Anilkumar  |  |
|                | <i>Measuring Risk in the Grid with Marginal Metrics</i>  | <b>F. S. Yanikara - Newton Energy Group</b> , A. Rudkevich, R. Philbrick   |  |
|                | <i>Adoption of Network Model Management in the North American Power Industry</i>   | <b>J. Velez - Quanta Technology</b> , D. Qureshi, D. Haughton, G. Webster, M. Chapariha, T. Chang  |  |
| 4:00 – 4:15PM  | Transitional Break   |  |  |



# TUESDAY, NOVEMBER 12

\*TECHNICAL PROGRAM OPENS AT 7:45AM\*

| Time           | Event   | Speakers  | Location  |
|----------------|---|---|---|
| 4:15 – 5:45PM  | <b>Paper Session 3A</b>   |   | Raleigh Convention Center<br>Room 305A  |
|                | Evolving Planning Criteria for a Sustainable Power Grid   | <b>Authors</b><br>M. Lauby - North American Electric Reliability Corporation (NERC), V. Vittal, D. Novosel, C. Singh, T. Overbye, A. Bose, G. van Welie |   |
|                | The Impact of U.S. Reindustrialization on the Power Demand  | P. Vij - Electric Power Research Institute (EPRI), P. Patel   |   |
|                | Utility Resource Planning for Electric Vehicles & Beneficial Electrification  | G. DiAntonio - S&C Electric Company   |   |
|                | Towards a Greener Grid: Sustainable Methods in Substation Design and Construction   | S. Murugappan - Hitachi Energy, L. Rodriguez, P. Skarby, K. L. Amaya, N. Reppas, M. Christerson   |   |
| 4:15 – 5:45PM  | <b>Paper Session 3B</b>   |   | Raleigh Convention Center<br>Room 305B  |
|                | Comparing Advanced Cores - Achieving Maximum Grid Capacity  | D. Berkowitz - Bekaert  |   |
|                | In-Situ Application of Capacity Enhancing Photonic Coatings to Overhead Conductors: Static Re-rating without Reconductoring                           | N. Coogan - AssetCool, A. Arevalo, O. Higbee, R. Dorzi, T. Saxena, R. Parker, G. Omahen, M. Kolenc, R. Marusa, U. Bavcar                                |   |
|                | Conductor Icing Risk Assessment and Detection with Weather and Position Monitoring  | K. Engel - LineVision Inc., R. Grudt, S. Pandey, W. Nation  |   |
|                | Automated Method for Transmission Line Constants Calculation to Improve Efficiency and Accuracy   | M. Malki - Quanta Technology, Y. Wang, S. Karki, K. Judd, A. Hernandez  |   |
| 4:15 – 5:45PM  | <b>Paper Session 3C</b>   |   | Raleigh Convention Center<br>Room 306A  |
|                | Transforming Protection & Control (P&C) Data: ConEdison's Approach to Data Alignment  | N. Klingerman - Quanta Technology, C. Gil, N. Manikarnika, B. Varughese   |   |
|                | The BC Hydro Distribution IED Gateway System for Managing Thousands of Grid Modernization Devices   | A. Hamdon - SUBNET Solutions Inc., K. Stich, A. Cheung, G. Ringham, S. Mercer   |   |
|                | Electrical Characterization of Vegetation Contacts with Medium Voltage Conductors: Summary of Field Experiments                                       | J. A. Wischkaemper - Texas A&M University, C. L. Benner, B. D. Russell, K. Manivannan   |   |
|                | National Grid Pilot of Phase-EQ Technology  | M. Hanestad - RLC Engineering, M. Smith, A. Sproul, C. Murray   |   |
| 4:15 – 5:45PM  | <b>Paper Session 3D</b>   |   | Raleigh Convention Center<br>Room 306B  |
|                | Operations of Future and Data-driven Uncertainty Management: Net Uncertainty Forecast and Dynamic Reserve in Midcontinent Independent System Operator | A. Ghesmati - Midcontinent Independent System Operator (MISO), C.-H. Tsai   |   |
|                | A Framework for Transfer Capability Analysis in Power Systems: An Automated Approach  | S. Lamichhane - Washington State University, Z. Jing, K. A. Vance, N. A. Rice   |   |
|                | Generator Prioritization for Voltage Control Based on Bus Voltage Sensitivity   | B. Steele - Oklahoma Gas & Electric, F. Ma  |   |
|                | Keep Your Grid Model to Yourself: Co-simulation for Multi-entity Planning and Simulation Without Needing Detailed Model Exchange                      | B. Palmintier - National Renewable Energy Laboratory (NREL), T. Hardy, P. Top, A. Latif, J. Keen  |   |
| 4:15 – 5:45PM  | <b>Paper Session 3E</b>   |   | Raleigh Convention Center<br>Room 306C  |
|                | A System Architecture for Wildfire Situational Awareness Using Artificial Intelligence and Remote Sensing   | A. Arabnya - University of Denver, M. Salimitari, A. Khodaei, A. Paaso  |   |
|                | Insights from PJM Interconnection's Exploration of Artificial Intelligence  | L. Walter - PJM Interconnection, A. Cabezas, N. Militello, J. Gluck, E. Kovler, M. Luna, E. Lynch   |   |
|                | Enhancing Testing Strategies for Machine Learning, Digital Twin, and Artificial Intelligence Applications in Power Systems: A Risk-Based Approach     | G. Lopes - Siemens Energy, Y. Rossini, L. Tao, B. Stuck, R. Mishra  |   |
|                | Advancing Power Grid Intelligence: Integrating Data Models and Real-Time Analytics for Improved System Management and Operation                       | M. C. Cinalioglu - Siemens Energy, Y. Kaya  |   |
| 6:00 – 10:00PM | CIGRE Welcome Reception Sponsored by Quanta Technology  |   | North Carolina Museum of Natural Sciences<br>11 W Jones St, Raleigh, NC 27601 |

# WEDNESDAY, NOVEMBER 13

**\*TECHNICAL PROGRAM OPENS AT 7:45AM\***

| Time            | Event  | Speakers  | Location                                      |
|-----------------|--|---|---|
| 7:00AM – 4:30PM | CIGRE – Registration/Badge Pickup<br><i>*Breakfast is on your own unless you've signed up for the NGN Breakfast event*</i> |   | Raleigh Convention Center<br>North Main Lobby |
| 6:45 – 7:35AM   | NGN Breakfast  | Aditie Garg – <i>Buildings Technologies &amp; Sciences Center, NREL</i>   | Sheraton Hotel<br>Hannover Ballroom           |
| 7:45 – 8:15AM   | CIGRE General Session & Keynote Address  | Chris Root – <i>CIGRE USNC</i><br>Ed Baine – <i>Dominion Energy</i>   | Raleigh Convention Center<br>Ballroom C       |
| 8:15 – 8:30AM   | NGN Paper Award Winner Announcement  | Jodie Lupton – <i>Salt River Project</i>  | Raleigh Convention Center<br>Ballroom C       |
| 8:30 – 9:30AM   | CIGRE Panel Session:<br>End-to-End Grid Resilience for the Energy Transition   | <b>Moderator:</b><br>John McDonald – <i>JDM Associates, LLC.</i><br><b>Panelists:</b><br>Dr. Mikael Dahlgren – <i>Hitachi Energy</i><br>Thomas Schmidt – <i>Ampacimon</i><br>Jeff Scheb – <i>Landis + Gyr</i> | Raleigh Convention Center<br>Ballroom C       |
| 9:30 – 9:45AM   | Morning Break  |   | Raleigh Convention Center North Hallway       |
| 9:45 – 11:15AM  | <b>Paper Session 4A</b>  | <b>Authors</b>  | Raleigh Convention Center<br>Room 305A        |
|                 | <i>Interconnected Ground Grids and Their Design - A Case Study</i>   | <b>M. Kavimandan - Burns &amp; McDonnell</b>  |   |
|                 | <i>Benefits of Automated Overcurrent Protection Analysis of Distribution Grids</i>   | <b>S. Berhane - S&amp;C Electric Company</b> , B. Merendic, M. Meisinger, Y. Sharon   |   |
|                 | <i>A System Design Framework for Wildfire Risk Management in Electric Utilities</i>  | <b>A. Majzoobi - Quanta Technology</b> , A. Arabnya, D. Haughton, A. Paaso  |   |
|                 | <i>A Quantitative Wildfire Risk Assessment Framework for Electric Utilities</i>  | <b>H. A. Gil - Quanta Technology</b> , A. Majzoobi, D. Haughton, A. Arabnya, A. Paaso   |   |
| 9:45 – 11:15AM  | <b>Paper Session 4B</b>  | <b>Authors</b>  | Raleigh Convention Center<br>Room 305B        |
|                 | <i>A Novel Approach to the Determination of Asset Criticality and its Use in Asset Replacement Planning</i>                | <b>S. Varadan - Quanta Technology</b> , K. Vu, J. Schmidt, J. Schraufnagel  |   |
|                 | <i>Storage as a Transmission Asset in the Grid of the Future: Usage and Business Cases of BESS</i>                         | <b>S. Subramanian - Saft Batteries</b>  |   |
|                 | <i>ABCs of Asset Investment Planning</i>   | <b>J. Schmidt - Quanta Technology</b> , V. Chhabra, S. Varadan  |   |
|                 | <i>Load Forecasting Analysis for a Small Island Utility: Identifying Challenges to a Modernizing Grid</i>                  | <b>K. Inge &amp; C. Menning - MPR Associates, Inc.</b>  |   |

# WEDNESDAY, NOVEMBER 13

\*TECHNICAL PROGRAM OPENS AT 7:45AM\*

| Time              | Event  | Speakers   | Location                                |
|-------------------|--|--|---|
| 9:45 – 11:15AM    | <b>Paper Session 4C</b>  | <b>Authors</b>   | Raleigh Convention Center<br>Room 306A  |
|                   | <i>Comprehensive Cybersecurity Technology for Critical Power Infrastructure AI-Based Centralized Defense and Edge Resilience</i>               | <b>S. B. A. Venkata - Resource Innovations</b> , J. Dirkman, F. Magnago  |   |
|                   | <i>Monitoring and Detection of Anomalies on Power Network Equipment Via SNMP and Syslog Can Pay Dividends</i>                                  | <b>D. Williams - Burns &amp; McDonnell</b> , R. Luechtefeld, D. Eckert   |   |
|                   | <i>Active Power Malicious Attack Identification</i>  | <b>G. E. N. Piegan - George Mason University</b>   |   |
|                   | <i>ÉCLAIR: A High-Fidelity Aerial LiDAR Dataset for Semantic Segmentation</i>  | <b>A. Umashankar &amp; L. Stannis - Sharper Shape</b> , I. Melekhov, H.-J. Kim, D. Argyle  |   |
| 9:45 – 11:15AM    | <b>Paper Session 4D</b>  | <b>Authors</b>   | Raleigh Convention Center<br>Room 306B  |
|                   | <i>Direct Transfer Trip Implementation for Multi-terminal Lines Using IEC61850</i>   | <b>K. Malpede - Commonwealth Edison</b> , M. Pregara   |   |
|                   | <i>Unified Grid Control Platform Requirements of Process Bus Test Results</i>  | <b>P. Myrda - Electric Power Research Institute (EPRI)</b> , G. Wilson, H. Falk, S. McGuinness, E. Udren   |   |
|                   | <i>Leveraging IEC 61850 Functional Simulation to Reduce Risk, Cost, and Development Time in Every Phase of a Distributed Automation System</i> | <b>J. Moore - Triangle MicroWorks, Inc.</b> , D. Goughnour, S. Shanghavi   |   |
|                   | <i>Control of 61850 GOOSE Lockout Relays via HMI Visualization</i>   | <b>A. Fishbeck - Commonwealth Edison</b> , V. Lazzaro  |   |
| 9:45 – 11:15AM    | <b>Paper Session 4E</b>  | <b>Authors</b>   | Raleigh Convention Center<br>Room 306C  |
|                   | <i>High-Fidelity Synchronized Measurements to Support Grid Resiliency and Asset Management in Puerto Rico</i>                                  | <b>F. Rahmatian - NuGrid Power Inc.</b> , J. R. Marina, S. E. Vega Blasini, A. Paaso   |   |
|                   | <i>LUMA Energy Large Scale Distribution Feeder Protection Modernization Project</i>  | <b>B. Zarovniaev - Quanta Technology &amp; C. T. Ocasio Rodriguez - LUMA Energy</b> , H. Self, T. Fix, J. Aguilar, A. Smit, J. Hudson, J. N. Ferrer Ortiz  |   |
|                   | <i>Planning Synchronized Measurement Technology Deployment in LUMA Energy</i>  | <b>E. Udren - Quanta Technology</b> , D. Brancaccio, B. Enayati, F. Aminifar, J. Sykes, M. Lelic, D. Hart  |   |
|                   | <i>Voltage Optimization under High Renewable Penetration: Tackling Reactive Power Challenges</i>   | <b>F. Magnago - Resource Innovations</b> , R. Treinen, M. Sadagopan, R. Emami, M. Prais, W. Vance, J. Bright, N. Vempati   |   |
| 11:15 – 11:30AM   | Transitional Break   |  |   |
| 11:30AM – 12:45PM | Buffet Style Lunch<br>Technical Activities Overview  | John McDonald – <i>JDM Associates, LLC.</i><br>Philippe Adam – <i>CIGRE</i>  | Sheraton Hotel<br>Hannover Ballroom     |
| 12:45 – 1:00PM    | Transitional Break   |  |   |
| 1:00 – 2:00PM     | CIGRE Panel Session:<br>Interconnection and the Evolving Grid  | <b>Moderator:</b><br>Jessica Lau<br><b>Panelists:</b><br>Maigha – <i>Exelon BSC</i><br>Myra Sinnott – <i>Silicon Ranch</i><br>Preety Mathema – <i>1898 &amp; Co.</i><br>Regina-GuoFang Gao – <i>Hitachi Energy</i> | Raleigh Convention Center<br>Ballroom C |
| 2:00 – 2:15PM     | Afternoon Break  |  | Raleigh Convention Center North Hallway |

# WEDNESDAY, NOVEMBER 13

**\*TECHNICAL PROGRAM OPENS AT 7:45AM\***

| Time          | Event  | Speakers   | Location                               |
|---------------|--|--|--|
| 2:15 – 3:45PM | <b>Paper Session 5A</b>  | <b>Authors</b>   | Raleigh Convention Center<br>Room 305A |
|               | <i>ComEd's Commissioning a Digital Smart Substation (DSS)</i>  | <b>J. Bettler - Commonwealth Edison</b> , A. Jaskoviak   |  |
|               | <i>Virtual Protection Relay: Quantifying the Reality</i>   | <b>M. Smith - Dell Technologies</b> , J. Ruiz, B. Gwyn, A. Sivesind  |  |
|               | <i>Migrating to Software-defined Architectures for T&amp;D Substations</i>   | <b>T. Godart - Fidelity, LLC.</b> , P. Khajuria  |  |
|               | <i>Towards the Digitalization and Virtualization of Power Grids</i>  | <b>R. Boyer - Dell Technologies</b> , D. Tzelepis, D. N. Trakas, A. Rousis   |  |
| 2:15 – 3:45PM | <b>Paper Session 5B</b>  | <b>Authors</b>   | Raleigh Convention Center<br>Room 305B |
|               | <i>LUMA's AMI Journey: Leveraging Technology and Data Analytics</i>  | <b>L. Rossi - Quanta Technology</b> , S. Varadan, D. Larkin  |  |
|               | <i>The Challenges and Best Practices of Capturing Utility Asset Data for Puerto Rico</i>   | <b>S. Szekeres - Quanta Technology</b> , B. Enayati, A. Paaso, C. Segneri, A. Ilkani   |  |
|               | <i>Asset Condition Assessment: Using Asset Information to Inform Risk-Based Decisions</i>  | <b>J. Schraufnagel - Quanta Technology</b> , L. Randle-Smith, J. McNulty   |  |
|               |  |  |  |
| 2:15 – 3:45PM | <b>Paper Session 5C</b>  | <b>Authors</b>   | Raleigh Convention Center<br>Room 306A |
|               | <i>Leveraging Small-Signal Analysis to Address Dynamic Stability in Inverter-Based Resource Dominated Networks</i>               | <b>H. Davarikia - Electric Reliability Council of Texas (ERCOT)</b> , Y. Cheng, S.-H. Huang  |  |
|               | <i>Data-Driven Inverter-Based Resources Short Circuit Modelling Using Deep Learning</i>  | <b>Z. Cheng - Quanta Technology</b> , J. Holbach, S. Narayanan, D. G. Hart   |  |
|               | <i>Beyond EMT Model Collection: Model Validation and Use</i>   | <b>J. Olowolaju - University of Nevada-Reno</b> , G. M. Ilunga, Z. Zhang, A. Pinceti, I. O. Korede, K. A. Vance  |  |
|               | <i>EMT Model Development and Power Quality Investigation of a Utility Solar Site</i>   | <b>S. Banik - North Carolina State University</b> , G. M. Ilunga, G. B. Alvarez, A. T. Valdez, I. O. Korede, K. A. Vance   |  |
| 2:15 – 3:45PM | <b>Paper Session 5D</b>  | <b>Authors</b>   | Raleigh Convention Center<br>Room 306B |
|               | <i>Microgrid Challenges: Research and Tribal Community Perspectives</i>  | <b>G. E. N. Piegan - George Mason University</b> , L. Huang  |  |
|               | <i>Cost-Benefit Assessment of MBB-Based Microgrids</i>   | <b>A. K. Jain - Pacific Northwest National Laboratory (PNNL)</b> , C. Qi, C. C. Liu, R. Zhang, D. Boroyevich, H. B. Ashraf, B. Somda, L. Qi, J. O. P. Pinto, M. M. Montejano, M. S. Chinthavali, A. K. Bharati, F. Tuffner, S. Acharya, H. Mahmood, P. Mana, R. Hovsopian, S. Chanda, D. Ton |  |
|               | <i>Empowering Grid Resilience: Leveraging Distributed Energy Resources</i>   | <b>K. Zeng - POWER Engineers</b> , D. Paresa, M. Adham, R. Bass  |  |
|               | <i>A Practical Protection Scheme for a Partial Feeder Microgrid with Dynamic Point of Common Coupling</i>                        | <b>L. Zhu - Electric Power Research Institute (EPRI)</b> , C. Zhang, V. Ma, Y. Su, F. Wang, L. Tolbert, Y. Liu, H. Yin, I. Ray, D. Li, J. Glass, R. Johnson  |  |
| 2:15 – 3:45PM | <b>Paper Session 5E</b>  | <b>Authors</b>   | Raleigh Convention Center<br>Room 306C |
|               | <i>Impact of Geomagnetically Induced Currents on Differential Protection for Transmission-Level Transformers</i>                 | <b>L. Chebbo - University of Connecticut</b> , A. A. Ademola, A. Mohammadhassani, I. O. Korede, K. A. Vance  |  |
|               | <i>Observed Effects of Geomagnetic Disturbances from Wide Area Monitoring System</i>   | <b>T. Laughner - Lifescale Analytics</b> , J. Anderson, S. Heckman, B. Marshall  |  |
|               | <i>Impact of Characteristics of GIC Signature on Thermal Effects of GIC on Power Transformers</i>                                | <b>R. Girgis - Hitachi Energy</b> , M. Bernesjo  |  |
|               | <i>Enhancing Power Grid Utilization and Reliability: Simulation and Cost Models for Advanced Power Flow Control Technologies</i> | <b>S. Guggilam - Electric Power Research Institute (EPRI)</b> , A. Del Rosso   |  |



# WEDNESDAY, NOVEMBER 13

\*TECHNICAL PROGRAM OPENS AT 7:45AM\*

| Time          | Event  | Speakers   | Location                                |
|---------------|--|--|---|
| 3:45 - 4:00PM | Transitional Break   |  |   |
| 4:00 - 5:00PM | CIGRE Panel Session:<br>Future Outlook of Transmission: Superhighway or Bottleneck | <b>Moderator:</b><br>Wayne Bishop - <i>Quanta Technology</i><br><b>Panelists:</b><br>Joe Svachula - <i>Exelon</i><br>Mark Carpenter - <i>ONCOR</i><br>Mark Lauby - <i>NERC</i> | Raleigh Convention Center<br>Ballroom C |
| 5:30 - 7:30PM | NGN Dinner Sponsored by Burns & McDonnell and POWER Engineers                      | Doug Jones - <i>POWER Engineers</i>  | <i>Invitation Only</i>                  |

# THURSDAY, NOVEMBER 14

\*TECHNICAL PROGRAM OPENS AT 7:45AM\*

| Time             | Event   | Details  | Location                               |
|------------------|---|--|--|
| 8:00AM - 12:00PM | Tutorial<br>Addressing Integration Challenges of Voltage Source Converters (VSCs) | Hosted by Mitsubishi Electric Power Products, Inc.<br>Includes a continental breakfast | Raleigh Convention Center<br>Room 305A |
| 8:30 - 11:30AM   | Tour<br>Smart Wires Laboratory Tour   | Hosted by Smart Wires<br>GoGo Bus Tours<br>Includes a box lunch                        | Meet in Sheraton Hotel Lobby           |
| 10:00AM - 1:00PM | Tour/Tutorial<br>Value of Hardware-in-the-Loop (HIL) Testing                      | Hosted by Quanta Technology<br>GoGo Bus Tours<br>Includes a box lunch                  | Meet in Sheraton Hotel Lobby           |
| 10:15AM - 1:30PM | Tour<br>North Carolina State University (NCSU) FREEDM Center Tour                 | Hosted by NCSU<br>GoGo Bus Tours<br>Lunch provided by Hitachi Energy                   | Meet in Sheraton Hotel Lobby           |
| 2:00PM           | Adjourn   |  |  |