

73rd Annual

# Georgia Tech Protective Relaying Conference AGENDA

**May 1-3, 2019 - Georgia Tech Hotel and Conference Center, Atlanta, GA**

## Tuesday April 30, 2019

4:30 - 6:30 PM	Registration - Salon 1-2-3-4-5-6
5:00 - 9:00 PM	Vendor Exhibits Open

## Wednesday May 1, 2019

Salon 1-2-3-4-5-6		<i>Session Chair:</i> <b>Robert Frye</b> , Tennessee Valley Authority <i>Backup:</i> <b>Craig Wester</b> , GE Grid Solutions	
7:00 AM		Registration	
7:50 - 8:00 AM		Conference Opening - Welcoming Remarks <b>Sakis Meliopoulos</b> , Professor, School of Electrical and Computer Engineering	
8:00 - 8:35 AM WA-0-P1		Lessons Learned From Implementation of Microgrid Islanding Detection Schemes Based on Rate of Change of Frequency (ROCOF) and Synchophasor Measurements <b>Aleksandar Vukojevic</b> , Duke Energy <b>Shyam Bhaskaram, Justin McDevitt, John Town</b> , Schweitzer Engineering Laboratories, Inc.	
8:35 - 9:10 AM WA-0-P2		Anti-Islanding Protection Philosophy: Past, Present and Unintended Consequences <b>Manish Patel, Ted Warren</b> , Southern Company Services	
9:10 - 9:25 AM		Break	
Salon 4-5-6	<i>Session Chair:</i> <b>Bruce Mackie</b> , Nashville Electric Service <i>Backup:</i> <b>Bridget Coffman</b> , Santee Cooper	Salon 1-2-3	<i>Session Chair:</i> <b>Flavio Graciaa</b> , Southern Company <i>Backup:</i> <b>Stephen Ladd</b> , Duke Energy Carolinas
9:25- 10:00 AM WA-1-P1	Sequence Component Applications in Protective Relays – Advantages, Limitations, and Solutions <b>Bogdan Kasztenny, Normann Fischer, Mangapathirao Mynam</b> Schweitzer Engineering Laboratories, Inc.	9:25- 10:00 AM WA-2-P1	PNM Approach to Protecting Overcompensated High-Voltage Lines <b>Kamal Garg, Mangapathirao Mynam, Eric Chua, Jordan Bell</b> , Schweitzer Engineering Laboratories, Inc. <b>Henry Moradi</b> , Public Service Company of New Mexico
10:05 - 10:40 AM WA-1-P2	Analysis of Microprocessor Relay Response on Surge Arrester Protection Schemes <b>Jeff Brogdon, Sadel Fetic, Addis Kifle</b> Georgia Transmission Corporation	10:05 - 10:40 AM WA-2-P2	Analysis of Directional Overcurrent Protection Over-Trip on Leading Power Factor Load & Application of Load Encroachment at National Grid <b>Yujie Irene Lu, Song Ji, David Lovely</b> , National Grid USA
10:45 - 11:20 AM WA-1-P3	Control House and Relay Design Considerations for EMP Resiliency <b>Roy Mao, Harsh Vardhan</b> GE Grid Solutions <b>Aaron Ingham, Barry Howe, Sarah Pink</b> Trachte <b>Curtis Birnbach</b> , Advanced Fusion Systems <b>Mark Adamiak</b> , Adamiak Consulting	10:45 - 11:20 AM WA-2-P3	An Introduction to Completing a NERC PRC-026 Study for Traditional Generation Applications <b>Matt Horvath, Matthew Manley</b> POWER Engineers, Inc.

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## Wednesday May 1, 2019

11:25 - 12:00 PM WA-1-P4	<b>Innovative Approach to Meet NYC System Reliability and Resilience Needs</b> <b>Ed Wah Chen, Anastasia O'Malley, Nadia Ali, Leslie Philp, Diego Pichardo, Fabricio Mantilla</b> Consolidated Edison of New York <b>Rogério Scharlach, Satish Samineni</b> Schweitzer Engineering Laboratories, Inc.	11:25 - 12:00 PM WA-2-P4	<b>Dominion Energy's Open Phase Project</b> <b>Richard Tuck, Francisco Velez-Cedeno, Gerald Warchol, Michael Morris</b> Dominion Energy
12:00 - 1:15 PM	<b>Lunch - On Your Own</b>	12:00 - 1:15 PM	<b>Lunch - On Your Own</b>
Salon 4-5-6	<i>Session Chair:</i> <b>Murty Yalla</b> Beckwith Electric Company <i>Backup:</i> <b>David Busot</b> Tampa Electric Company	Salon 1-2-3	<i>Session Chair:</i> <b>Joe Schaefer</b> Florida Power & Light <i>Backup:</i> <b>Craig Wester</b> GE Grid Solutions
1:15 - 1:50 PM WP-1-P1	<b>Utility Experience with Travelling Wave Fault Locating on Lower Voltage Transmission Lines</b> <b>Robert James, Scott Hayes</b> Pacific Gas & Electric Company	1:15 - 1:50 PM WP-2-P1	<b>Review of Capacitor Bank Control Practices</b> <b>Iliia Voloh, Tom Ernst</b> , GE Grid Solutions
1:55 - 2:30 PM WP-1-P2	<b>Traveling-Wave-Based Accurate Fault Location Method Adaptive for Evolving Faults and Switch-on Events</b> <b>Hengxu Ha, Adriano Pires, Terrence Smith, Rodrigo Donadel, Saurabh Makwana, Lucas Barcelos, Paulo De-Souza</b> , GE Grid Solutions	1:55 - 2:30 PM WP-2-P2	<b>Application Considerations for Protecting Transformers With Dual Breaker Terminals</b> <b>Ryan McDaniel, Michael Thompson, Kunal Salunkhe</b> , Schweitzer Engineering Laboratories, Inc. <b>Shahab Uddin, Abu Bapary</b> American Electric Power
2:35 - 3:10 PM WP-1-P3	<b>Protection Solutions for Refinery Transmission Upgrade from a Radial to Looped Configuration</b> <b>Heath Lessard</b> Marathon Petroleum Company <b>Kyle Bennett</b> , POWER Engineers, Inc.	2:35 - 3:10 PM WP-2-P3	<b>IEC 61850 Digital Substation Design Tutorial for Novices</b> <b>Antonio Riccardo</b> , National Grid <b>Harsh Vardhan</b> , GE Grid Solutions
3:10 - 3:40 PM	<b>Break</b>	3:10 - 3:40 PM	<b>Break</b>
3:40 - 4:15 PM WP-1-P4	<b>Advanced Distribution Automation Application with Mis-coordination Correction Algorithm Based on Neural Network</b> <b>Alexandr Stinskiy, Andre Smit</b> Siemens Industry <b>Christopher Huff, Bryan Pham, Nicholas Duong</b> , Southern California Edison	3:40 - 4:15 PM WP-2-P4	<b>Packet-Based Teleprotection Design and Testing</b> <b>Stephen Craven, Ha Vo, Tuan Tran, Gary Kobet</b> Tennessee Valley Authority
4:20 - 4:55 PM WP-1-P5	<b>Site Acceptance Testing of a Duke Energy Distribution Automation Project Utilizing a Simulation Based Test Approach</b> <b>John Hart, Peter Hoffman</b> , Duke Energy <b>Erich Keller, Bob Westphal</b> G&W Electric Company <b>Robert Wang, Scott Cooper, Christopher Pritchard</b> , OMICRON electronics	4:20 - 4:55 PM WP-2-P5	<b>Mitigating Carrier Holes in Power Line Carrier</b> <b>Tony Bell</b> , Ametek-Pulsar Products
4:55 PM	<b>Adjourn</b>	4:55 PM	<b>Adjourn</b>
5:00 - 9:00 PM	<b>Vendor Exhibits Open</b>	5:00 - 9:00 PM	<b>Vendor Exhibits Open</b>

# AGENDA

## Thursday May 2, 2019

<b>Salon 4-5-6</b>	<i>Session Chair:</i> <b>Alexander Apostolov</b> OMICRON electronics <i>Backup:</i> <b>Marion Cooper</b> POWER Engineers, Inc.	<b>Salon 1-2-3</b>	<i>Session Chair:</i> <b>Craig Black</b> , Duke Energy Florida <i>Backup:</i> <b>Andre Smit</b> , Siemens Industry
<b>8:00 - 8:35 AM</b> TA-1-P1	<b>The Impact of Distributed Energy Resources on Arc Flash Incident Energy</b> <b>Gefei "Derek" Kou, Jonathan Deverick, Tin Nguyen, Francisco Velez-Cedeno</b> Dominion Energy <b>Kevin Phelps</b> , Virginia Polytechnic Institute and State University	<b>8:00 - 8:35 AM</b> TA-2-P1	<b>How the Engineering Design Process Can Simplify the Testing of Automation and Control Systems</b> <b>Eugenio Carvalheira, Andreas Klien</b> OMICRON electronics
<b>8:40 - 9:15 AM</b> TA-1-P2	<b>Assessment of Protection Functionality and Performance with Respect to Declining System Fault Levels and Inertia due to a Significant Increase of Inverter Based Generation on National Grid's Transmission System in the United Kingdom</b> <b>Juergen Holbach, Solveig Ward</b> Quanta Technology <b>Ray Zhang, Barrie Ellison</b> , National Grid UK	<b>8:40 - 9:15 AM</b> TA-2-P2	<b>Challenges One May Not Expect to Face When Applying Digital Relays</b> <b>Miroslav Ristic, Harjeet Gill</b> Pacific Gas & Electric Company <b>Iliia Voloh</b> , GE Grid Solutions
<b>9:20 - 9:55 AM</b> TA-1-P3	<b>Implementation of IEC 61850 Based Protection and Control Techniques within Duke Energy's Mount Holly Microgrid</b> <b>Aleksandar Vukojevic</b> , Duke Energy	<b>9:20 - 9:55 AM</b> TA-2-P3	<b>A POTT Scheme, using Transient Directional Elements, for a Complex 500kV Transmission Corridor Comprising Long, Heavily Loaded and Heavily Series Compensated Parallel Lines</b> <b>Michael Kockott, Sinisa Zubic, Zhiying Liu, Hans Jernberg</b> , ABB Inc. <b>Tom Roseburg, Warren Rees</b> , BPA
<b>9:55 - 10:10 AM</b>	<b>Break</b>	<b>9:55 - 10:10 AM</b>	<b>Break</b>
<b>10:10 - 10:45 AM</b> TA-1-P4	<b>Compensator Phase-to-Ground Fault Coverage Through a Wye-Delta Transformer – A Case Study</b> <b>Ryan McDaniel, Harish Chaluvadi, Michael Thompson</b> Schweitzer Engineering Laboratories, Inc. <b>Dustin Hohenbery</b> , Caterpillar	<b>10:10 - 10:45 AM</b> TA-2-P4	<b>Exploring IEEE C37.246-2017 Guide for Protection Systems of Transmission-to-Generation Interconnections</b> <b>Manish Patel</b> IEEE Power System Relaying and Control Committee
<b>10:50 - 11:25 AM</b> TA-1-P5	<b>Case Study: Analysis of 138/13.8 kV Transformer Differential Mis-operation Points to Faulty CT</b> <b>Morgan Smith</b> , Enmax <b>JC Theron</b> , GE Grid Solutions	<b>10:50 - 11:25 AM</b> TA-2-P5	<b>OOPS, Out-of-Phase Synchronization</b> <b>Nathan Klingerman, Kelvin Barner</b> Duke Energy <b>Michael Thompson, Ritwik Chowdhury, Dale Finney, Satish Samineni</b> Schweitzer Engineering Laboratories, Inc.
<b>11:40 - 12:30 PM</b>	<b>Conference Awards and Keynote Speaker Keynote Speech: Purposeful Wealth Management: Liquidity, Longevity, Legacy</b> <b>Michael Crook</b> , UBS Financial Services Inc.	<b>11:40 - 12:30 PM</b>	<b>Conference Awards and Keynote Speaker Keynote Speech: Purposeful Wealth Management: Liquidity, Longevity, Legacy</b> <b>Michael Crook</b> , UBS Financial Services Inc.
<b>12:30 - 1:30 PM</b>	<b>Lunch - Main Dining Room - 1st Floor</b>	<b>12:30 - 1:30 PM</b>	<b>Lunch - Main Dining Room - 1st Floor</b>

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## Thursday May 2, 2019

<b>Salon 4-5-6</b>	<i>Session Chair:</i> <b>Russell Patterson</b> Patterson Power Engineers <i>Backup:</i> <b>Mike Collum</b> Schweitzer Engineering Laboratories, Inc.	<b>Salon 1-2-3</b>	<i>Session Chair:</i> <b>Chris Jones</b> Southern Company <i>Backup:</i> <b>Philip VanSant</b> Dominion Energy
<b>1:30 - 2:05 PM</b> TP-1-P1	<b>New Intelligent Direct Transfer Trip over Cellular Communication</b> <b>Terry Fix, Joseph Petti</b> , Dominion Energy <b>Joseph Key</b> , Central VA Electric Cooperative <b>Andre Smit, Suraj Chanda</b> Siemens Industry	<b>1:30 - 2:05 PM</b> TP-2-P1	<b>To Improve the Security of Line POTT Scheme by Supervising Directional Ground Overcurrent Function with Negative-Sequence Voltage</b> <b>Song Ji, Yujie (Irene) Lu, Michael Gregg, Robert Simpson, Clayton Burns</b> National Grid USA
<b>2:10 - 2:45 PM</b> TP-1-P2	<b>Tutorial on Networking for Digital Substations</b> <b>Richard Hunt, Carlos Pimentel, Gustavo Silvano, Marcelo Zapella</b> GE Grid Solutions	<b>2:10 - 2:45 PM</b> TP-2-P2	<b>Addressing the Challenges of Building a Fully Automated Fault Location System</b> <b>Juergen Holbach, Damir Novosel, Eric Udren, Xinyang Dong</b> Quanta Technology <b>Jonathan Sykes, Moinca Anderson</b> Pacific Gas & Electric Company
<b>2:45 - 3:15 PM</b>	<b>Break</b>	<b>2:45 - 3:15 PM</b>	<b>Break</b>
<b>3:15 - 3:50 PM</b> TP-1-P3	<b>Challenges Testing Low Impedance Bus Differential Relays</b> <b>Terrence Smith, Paul Smith</b> GE Grid Solutions <b>Jason Eames</b> , Tennessee Valley Authority	<b>3:15 - 3:50 PM</b> TP-2-P3	<b>Overcurrent Protection Coordination in Automated Distribution Feeders</b> <b>Kernie Houser</b> , Mesa Associates Inc. <b>Mathew Stinnett</b> , Knoxville Utilities Board <b>Andre Smit, Suraj Chanda, Alexandr Stinskiy</b> Siemens Industry
<b>3:55 - 4:30 PM</b> TP-1-P4	<b>Arc Resistance Coverage and Mho Expansion - The Devil is in the Details</b> <b>Craig Holt, Russell Patterson, Akram Saad</b> Patterson Power Engineers, LLC	<b>3:55 - 4:30 PM</b> TP-2-P4	<b>Remote Voltage Bias Technique to Prevent Low Voltages on an Electric Power Distribution Network with a High Penetration of DERs</b> <b>Murty Yalla</b> , Beckwith Electric Company
<b>4:35 - 5:10 PM</b> TP-1-P5	<b>Implementation of a New Algorithm to Detect Turn-to-Turn Faults in Shunt Reactors and Identify the Faulted Phase</b> <b>Paul Nyombi</b> , XCEL Energy <b>Pratap Mysore</b> Pratap Consulting Services, LLC <b>Zhiying Zhang</b> , GE Grid Solutions	<b>4:35 - 5:10 PM</b> TP-2-P5	<b>Evaluating Overhead Line Reclosing Sequences Based on Transformer Through-Fault Exposure</b> <b>Ed Atienza, Chris Kelley</b> Schweitzer Engineering Laboratories, Inc.
<b>5:10 PM</b>	<b>Adjourn</b>	<b>5:10 PM</b>	<b>Adjourn</b>
<b>5:10 - 9:00 PM</b>	<b>Vendor Exhibits Open</b>	<b>5:10 - 9:00 PM</b>	<b>Vendor Exhibits Open</b>

# AGENDA

## Friday May 3, 2019

<b>Salon 1-2-3-4-5-6</b>	<i>Session Chair: Philip VanSant</i> , Dominion Energy <i>Backup: Robert Frye</i> , Tennessee Valley Authority
<b>8:00 - 8:35 AM FA-P1</b>	<b>High-Density Distribution Substation Design at Duke Energy</b> <b>Brett Ross</b> , University of Central Florida <b>Jezzel Martinez</b> , Duke Energy Florida
<b>8:35 - 9:10 AM FA-P2</b>	<b>Trend in Fault Currents with Increased Penetration of Solar Generation</b> <b>Manish Patel</b> , Southern Company Services
<b>9:10 - 10:40 AM FA-RWE</b>	<b>Real World Experiences</b> <i>Chair: Andre Smit</i> , Siemens / <i>Vice Chair: Robert Frye</i> , Tennessee Valley Authority This session provides a forum for short presentations on “real life” experiences. Presenters will share protection related events in areas of operations, lessons learned, best practices and/or information on unique events.
<b>10:45 - 12:00 NOON FA-PANEL</b>	<b>Panel Session: Distributed Energy Resources</b> <i>Chair: Murty Yalla</i> , Beckwith Electric Company / <i>Vice Chair: Joe Schaefer</i> , Florida Power & Light This session will provide several short presentations on Distributed Energy Resources by each panelist and a question & answer period with all panelists.
<b>12:00 NOON</b>	<b>Conference Ends</b>