

2019 SPRING TECHNICAL WORKSHOP ALBUQUERQUE, NM

March 19 - 21, 2019

19 Tuesday

7:00 – 8:00 a.m.

8:00 a.m. – 12:00 p.m.

Our 2019 Spring Technical Workshop will take place at the Hyatt Regency Tamaya Resort & Spa, just outside of Albuquerque, New Mexico.

This three-day event will include a half-day tutorial, ESIG Working Group Meetings, and our technical workshop.



Registration & Breakfast

Location: Rio Grande Bar

Tutorial: Impact of DER on Bulk System

Location: Tamaya FGH

Chair: **Aidan Tuohy**, EPRI

As the penetration of distributed energy resources (DER) increases and distribution systems become increasingly “active”, the role of the distribution system operator (DSO) and their interaction with the transmission system operator (TSO) becomes increasingly complex. This tutorial will provide attendees the opportunity to hear about real world experiences and participate in a discussion on the future challenges and opportunities in the area of transmission and distribution coordination. With the findings of a DOE-funded project and two recent expert workshops on transmission and distribution (T&D) coordination providing a platform for the tutorial, the panelists assembled will provide overview and insights into their experiences navigating the interface between T and D. It is important for both sides of the interface to understand the others concerns and requirements. Challenges and solutions will be discussed from the perspective of transmission operations, distribution operations, transmission planning and distribution planning. Issues will be addressed from the perspective of regions already experiencing significant T&D interaction, and those yet to see significant change but who are planning towards it. After each panelist presents their viewpoint, a facilitated discussion with strong audience participation will ensure that the key points are distilled and analyzed, so attendees can take away a greater understanding of this complex and important topic.

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10:00 – 10:30 a.m.

Break

Location: Bear Prefunction

12:00 – 1:00 p.m.

Lunch

Location: Rio Grande Bar

1:00 – 3:00 p.m.

Research and Education Working Group

Chair: **Mark O'Malley**, NREL

Location: Bear

The Research and Education Working Group will continue discussion and preparation of the ESI research road map. The work will continue the next week at a special session of ESIG's Second International Conference on Energy System Integration, which will be hosted at Imperial College in London.

1:00 – 3:00 p.m.

Reliability Working Group

Co-chairs: **Sebastian Achilles** / **Jason MacDowell**, GE **Location:** Eagle

The Reliability Working Group will hold the first meeting of the High-Share of Inverter-Based Generation Task Force. This includes discussion and presentations around challenges and technology capability (such as grid forming inverters) to address system reliability needs with high penetration of inverter-based resources. The modeling task force will also cover modeling needs and updates for inverter-based resources.

1:00 – 3:00 p.m.

System Operation and Market Design Working Group

Chair: **Aidan Tuohy**, EPRI

Location: Tamaya FGH

The System Operations and Market Design WG will continue sharing recent experience and identifying challenges and solutions related to energy systems integration. This includes discussions and presentations on system and market operations developments related to FERC Order 841 and energy storage integration, operating strategies for dealing with uncertainty, outage planning implications of increased wind and solar penetration and operational considerations of increased TSO-DSO interaction. The WG meeting will take the form of a panel discussion on one main topic, followed by member contributions to burning issues and discussion of potential and upcoming deliverables.

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3:00 – 3:15 p.m.

Break

Location: Bear Prefunction

3:15 – 5:15 p.m.

Distributed Energy Resources (DER) Working Group

Chair: **Debbie Lew**, GE

Location: Eagle

The DERWG will focus on DER behavior during disturbances and resulting operational issues; how protection practices change from the transmission to distribution system and resulting requirements from inverter-based resources; grid-forming converters applications in microgrids; and non-wires alternatives.

3:15 – 5:15 p.m.

System Planning Working Group Meeting

Chair: **Aaron Bloom**, NextEra Analytics

Location: Tamaya FGH

The System Planning WG will explore three topics in a talk show format. Panelists will be asked to discuss how their organization is planning for: new import and export patterns; extreme weather and climate; and neighbors that are aiming for 100% Renewable Energy. Participants are encouraged to submit questions ahead of the meeting to aaron.bloom@nexteraanalytics.com. Speaker nominations and self-nominations are welcome. At the end of the session, the attendees will vote on which of the three topics should result in an ESIG blog post.

6:00 – 8:30 p.m.

ESIG Board of Directors Meeting/Dinner

Location: Badger

20 Wednesday

7:00 – 8:00 a.m.

Registration & Breakfast

Location: Rio Grande Bar

8:00 – 9:00 a.m.

Welcome and Overview Session

Introduction

Location: Tamaya FGH

Mark Ahlstrom, NextEra Energy Resources

Local Welcome

Bob Cummings, NERC

Keynote Remarks

Todd Fridley, VP, New Mexico Operations, PNM

Meeting Overview

Charlie Smith, ESIG

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9:00 – 11:45 a.m.

Opening Plenary: Managing a High Penetration Power System

Chair: **Nick Miller**, Hickory Ledge Consulting **Location:** Tamaya FGH

MISO Renewable Energy Impact Assessment
Jordan Bakke, MISO

Grid Forming Inverters, What's the Buzz
Dennis Woodford, Electranix

A European View on Grid Forming Inverters
TBD, ENTSO-E

Grid Forming Inverters: Requirements and Practical Applications
Abraham Ellis, Sandia National Laboratory

Grid Forming Converter System Control Strategies
Deepak Ramasubramanian, EPRI

Grid Forming Inverters, A Way Forward
Julia Matevosyan, ERCOT

10:00 – 10:15 a.m.

Break

Location: Tamaya Prefunction North

11:45 a.m. – 12:15 p.m.

ESIG Annual Membership Meeting

Location: Tamaya FGH

12:15 – 1:15 p.m.

Lunch

Location: Rio Grande Bar

1:15 – 3:00 p.m.

Session 1 – Improving Flexibility and Frequency Response

Chair: **Bethany Frew**, NREL

Location: Tamaya FGH

Flexibility from Thermal/Electric Energy Systems Integration,
Danny Pudjianto, Imperial College, London

CHP as a source of flexibility in Northeast Branch of SGCC
Yu Jun, Northeast Branch, SGCC, China

Frequency Response Assessment of Three NA Interconnections with High PV Penetration
Yilu Liu, ORNL

El Frequency Response Assessment with Inverter Based Resources
Olushola J. Lutalo, NERC

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1:15 – 3:00 p.m.

Session 2 – Distribution System Developments

Chair: **Debbie Lew**, GE

Location: Bear

Planning the Integration of DER in the Columbian Power Grid
Lina Marcela Ramirez, XM Grid Operator, Colombia

Case Study on Integration of Solar, Storage and EVs
Chase Lansdale, Electric Power Engineers

Forecasting Adoption of DERs
Ben Sigrin, NREL

Market Integration of DERs and Storage
Dave Edelson, NYISO

3:00 – 3:15 p.m.

Break

Location: Tamaya Prefunction North

3:15 – 5:00 p.m.

Session 3 - Electric Transportation and Energy System Integration

Chair: **Obadiah Bartholomy**, SMUD

Location: Tamaya FGH

Energy Supply and Consumption with High EV Penetration
Todd Davidson, U of Texas, Austin

Integration of Electric Transportation
Bernie Ernst, Fraunhofer IEE

Planning a System for Large EV Penetrations
Ryan Pletka, Black and Veatch

Turning EVs into Grid Assets
Pamela MacDougall, NRDC

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3:15 – 5:00 p.m.

Session 4 - Preparing for Future Energy Systems

Chair: **Charlton Clark**, DOE

Location: Bear

Transmission Topology Optimization for Congestion Management
Pablo Ruiz, Brattle

Grid Services from Energy Storage Plants
Rebecca O'Neil, PNNL

Energy System Integration Modeling and Planning: Practice in China
Jingwei Yang, Tsinghua University, China

Future System Impact of DOE Solar Integration Activities
Guohui Yuan, DOE

Impact of VG on Average ISO Wholesale Prices
Andrew Mills, LBNL

6:30 – 8:00 p.m.

Annual Awards Reception & Student Poster Session

Location: Tamaya Veranda

21 Thursday

7:00 – 8:00 a.m.

Breakfast

Location: Rio Grande Bar

7:00 – 8:00 a.m.

Early Career Networking Breakfast

Location: Puma

8:00 – 9:45 a.m.

Session 5 - High Penetration and Weak Grid Issues

Chair: **Jason MacDowell**, GE

Location: Tamaya FGH

Blackstart of Wind and Solar Plant with Battery Grid Forming Inverter
Vahan Gevorgian, NREL

A First Methodology to Assess the Economic Cost Related to the Inertia Issue
Gregorie Prime, EDF, France

System Dynamic Interactions with Wind Plants
Shahil Shah, NREL

Qinghai High Penetration Case Study
Caixia Wang, SGERI, China

Weak Grid Case Study
Yongning Chi, CEPRI, China

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8:00 – 9:45 a.m.

Session 6 - Energy Storage Developments

Chair: **Russ Philbrick**, Polaris Optimization

Location: Bear

Filings in Response to FERC Order 841

Jason Burwen, Energy Storage Association

Demonstration of Advanced Frequency Response Battery Energy Storage for Low-inertia WECC Scenarios

Yingchen Zhang / Vahan Gevorgian, NREL

Energy Storage Optimization for Solar Power Plant Applications

Mak Nagle, sPower

Long Duration Energy Storage Batteries

Lynn Trahey, ANL

9:45 – 10:15 a.m.

Break

Location: Tamaya Prefunction North

10:15 a.m. – 12:30 p.m.

Closing Plenary – Long-term Planning Considerations

Chair: **Mark O'Malley**, NREL

Location: Tamaya FGH

CIGRE Global Electricity Network Feasibility Study

David Radu, University of Liège, Belgium

Incorporating the Social Cost of Carbon into Market Prices

Dave Edelson, NYISO

Integrated Gas and Electricity Planning

Antje Orths, Energinet

Role of Renewable Energy in Electrification and Decarbonization

Chris Clack, Vibrant Clean Energy

Consumer Behavior and Technology Adoption

Geertje Schuitema, University College Dublin

Working Group Meeting Summaries

Aaron Bloom, NextEra Analytics

12:30 – 12:40 p.m.

Closing Remarks

Charlie Smith, ESIG

Location: Tamaya FGH

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