State of the Utility:
How to Embrace Distributed Energy Resources (DER)
April 4, 2017 | Day 2
Panel: Market Impacts Driven by DER
Moderator: Ken Geisler, Panelists: Hugo Bashualdo and Bo Poats from Siemens PTI/Pace Global, A Siemens Business and Ahmed Mousa from PSE&G

Discussion of market trends driving DER and their results: load growth, fuel and power prices, declining revenues, renewables cost reduction, technology advancement, Storage, Regulatory, CPP, etc. What are the challenges the industry faces?

DER Systems Impacts
Speaker: Hugo Bashualdo from Siemens PTI

Successfully integrating increased levels of DER – including Distributed Generation (DG), energy storage systems (ESS), and demand response (DR) – into a distribution system is a complex process, impacting both transmission and distribution systems, and Planning and Operations departments. The identification of potential issues and designing of effective solutions relies heavily on effective planning and analysis.
Perspectives on Storage: Utility Economics across the Grid

Speaker: Venki Venkateshwara from Pace Global, A Siemens Business

Siemens Pace EBA experts and industry players will with examine the landscape with regard to electric storage. They will look at value streams that electric storage offers in specific applications (or “use cases”) and provide a perspective on storage as a stand-alone investment. Competing storage technologies – in terms of their cost, performance, and special features – will be discussed. From a utility planning perspective, the panel will examine the role that storage can play in bringing the flexibility required (e.g., through the provision of reserves) for utility systems to deal with non-dispatchable resources with high intermittency at the sub-hourly level.

The Pathway to DER Resiliency

Speaker: Sacha Fontaine from Pace Global, A Siemens Business

Distributed energy resources (DER) are allowing the industry to redefine reliability as resiliency – going beyond outage mitigation or recovery to outage prevention. In order to provide true outage prevention, onsite energy resources are necessary to circumvent outages affecting the grid. To transform DER into a resiliency asset, integration of DER will be needed. We will explore the transition path while considering financial and physical constraints and examine the DER Paradox relating to its destabilizing factor as well as its ability to add greater reliability. This path will lead us to the new services DER allows utilities to offer their customers.

Smart Planning, Smart Simulation Tools

Speakers: Hugo Bashualdo and Amar Patel from Siemens PTI

The immense distributed generation (DG) (e.g. Solar PV, wind generation, CHP, Energy Storage, etc) interconnection requirements, require an effective and agile distribution system impact analysis such as i) hosting capacity analysis, ii) utility scale generation integration system impact studies, iii) voltage regulation management, and iv) T&D protection system assessment. The new planning processes demand unified system modeling, agile simulations and smart post-processing. Siemens PTI will share case studies where advanced planning criteria, simulations and tools were developed to dramatically reduce the engineering time in performing comprehensive distribution system impact studies.
Panel: Modern Integrated Planning
Moderator Ken Geisler; Panelists: Hugo Bashualdo and Joe Canterino from Siemens PTI

Standard IRPs are becoming obsolete unless they consider explicitly factors that are traditionally a part of Transmission (T) or Distribution (D) planning in a fully integrated way. DER and renewable growth can strain both the transmission system to bring needed renewables to market and strain the grid in ways that are out of the utilities direct control. Portfolios need to fully consider DER penetration, grid modernization and optimization in the development of portfolios and testing them against alternative market futures.

Grid Investment Strategy Trifecta: Integrating Grid Modernization, DER Integration, and Best Practice Operations
Speaker: Bo Poats from Pace Global, A Siemens Business

In evaluating and addressing distribution grid system investment strategy under a structured approach, as provided by Siemens' Compass-BTS framework, it is critical to simultaneously address grid modernization investment options and DER integration impacts on the grid system, along with the Grid's target operational capabilities under emerging target performance standards. This best practice approach will enable the achievement of a higher level of customer service, regulatory support and shareholder value proposition over time. Siemens' Compass-BTS process is uniquely structured to enable grid system owners to realize full value via an integrated grid transformation process, capturing and fully integrating modernization technologies, performance capabilities and key technology and organizational performance requirements across these cornerstones of an effective grid transformation strategy.
Latest Updates on the PSS® Platform

April 4, 2017 | Day 2

What’s New and Upcoming in the PSS® Product Suite

*Speakers: Joe Hood, Jay Senthil, Krishnat Patil, Greg Mahlum, Shouming Zhang, and Mike Ward from Siemens PTI*

This section will provide an introduction to the PSS® Product Suite, a high-level overview of the new available features, and display what’s on the roadmap for future product functionalities/modules.

PSS®SINCAL for Integrated T&D Planning

*Speaker: Ulrike Sachs from Siemens PTI*

This section will provide a brief introduction to the PSS®SINCAL software, a comprehensive planning solution developed to support a truly integrated approach to utility planning. It will give an overview of how the tool bridges the gap between the historically independent transmission and distribution grid, and integrated resource planning by combining these methodologies/data infrastructures into one integrated process. Using this comprehensive view, utilities can more accurately characterize the value of DER on their system and identify the lowest cost options for installation and integration under a range of planning scenarios.

PSS®E New Module Deep-dives and Core Product Enhancements

*Speakers: Joe Hood and Jay Senthil from Siemens PTI*

This section will provide a deep-dive into the new PSS®E add-on modules and latest core product enhancements. Additionally, attendees will enjoy demonstrations for many of the new functions.

User Presentation: Automated Contingency Generation, Screening, and Ranking, using the PSS®E 34 Node Breaker Model

*Speaker: Anish Galkwad from EPRI*

EPRI has developed two tools to help meet TPL 001-4 compliance requirements. With the Node-Breaker representation of the power system the contingencies that need to be assessed across the various categories will be increased significantly. Additionally, some of the TPL contingency categories can only be generated with a Node-Breaker representation of the system. As such, EPRI developed the Automated Contingency Generation Tool that will automatically create all TPL category events for a given power flow, both in steady-state and dynamics. Finally, to quickly analyze all of the new contingencies that are created, the Contingency Screening and Ranking Tool was
developed. This tool utilizes a fast fault screening methodology to quickly screen and rank dynamic contingency events.

**User Presentation: PSS®E Improvements for Dynamic Simulation at MISO**

*Speaker: Nihal Mohan from MISO*

MISO is NERC Registered Planning Coordinator and develops models for NERC TPL-001-04, Generator Interconnection, and other internal studies. MISO utilizes the United States full Eastern Interconnection wide model for dynamic analysis, developed in PSS®E and TSAT. There were some significant challenges in dynamic model building process in PSS®E. This presentation will discuss some of the improvements and features developed by PTI based on MISO's input. The process improvement should enable PSS®E users to build dynamic models faster and coordinate information exchange in a more efficient manner.

**Networking and Software Demonstration Reception**

The welcome reception offers attendees the rare opportunity to mingle amongst Siemens PTI employees, enjoy hors d'oeuvres/cocktails, and be one of the first to try out new product features and enhancements. The highlighted product demonstrations include: PSS®SINCAL, PSS®E – new features, PSS®E GIC add-on module, and PSS®ODMS.
The Challenges of Transmission Model Management

*Speakers: Charles Dubose from Siemens PTI*

Network modelers face the challenge of maintaining models used to operate, protect and plan the transmission network accurately and to closely reflect the real world. This section will provide some insight into managing network models for multiple analysis platforms, engineering custom data storage required for different software vendor platforms, and accommodating varied topology requirements for operations, planning and relay protection into a single transmission network model.

User Presentation: "Channels"– A Program for Ranking Dynamics Simulation Results

*Speaker: José Conto from ERCOT*

Channels [.py] was developed to quickly scan many OUTs files to rank channels performance based on user criteria. It identifies channels that fail the criteria, with option to plot them [it scans any channel type for min, max violation, UV/OV delay recovery, peak-to-peak and delta violation.] It has a flexible option to select channels for ranking, plotting, exporting and printing basic information. Plotting features include all-at-once plot, p.u. plotting, plot comparing (for selected channels and multiple OUT's files).

PSS®MUST Enhancements Deep-dive and Product Roadmap

*Speakers: Joe Hood and Shouming Zhang from Siemens PTI*

The Siemens PTI team has been working heavily to improve the PSS®MUST product to fit the needs of our customers. This section will provide attendees with a detailed look into the development progress of PSS®MUST including new product enhancements, live demonstrations, and what’s on the product roadmap. View a live demonstration of PSS®MUST advanced dispatch methods and extensive automation.

User Presentation: Custom planning tools using PSS®E and PSS®MUST

*Speaker: Jerrod Moll from Southern Company*

Southern Company utilizes both PSS®E and PSS®MUST for all of its transmission planning analyses and have developed various custom processes that use PSS®E and MUST's API's. These custom processes have increased productivity, efficiency, and provided additional information for Southern Company's planning engineers. This presentation will dive deeper into 3 of these processes: Generation Impact Analysis, Available Capacity Analysis and DCCC->ACCC. The Generation Impact Analysis will analyze the system and help determine which unit out and area max scenarios are valid for a particular study. The Available Capacity Analysis will estimate the load growth at a bus before a project is needed. The DCCC->ACCC utilizes DCCC's to screen cases first to create a subset of contingencies to run an ACCC on.
PSS®E GIC Add-on Module
Speaker: Krishnat Patil from Siemens PTI

This section will cover a brief introduction to the PSS®E GIC add-on module, discussion on GIC data requirements and running GIC analysis studies to meet TPL-007-1 requirements.

Influencing the PSS® Roadmap: PSS® Ideals Portal
Speakers: Joe Hood

The PSS® Ideas Portal is an online platform for thousands of PSS® customers across the world to submit, vote, comment, and view the status of PSS® product ideas. In the past year, over 500 product ideas have been submitted. This section will provide a look into the most popular ideas and how they are being turned into product features.

User Presentation: Post Processing Tools for Contingency Analysis and Dynamics
Speaker: Matthew Spencer from Georgia Transmission Corporation

Georgia Transmission has created tools in python and visual studio to assist with PSSE studies, and to help with post processing. I will give an overview of some of these tools, including ACCC post processing using custom reports from pssaccss (also processes must ACO), cloud type computing manager, and dynamics post processing and graphing. Further details on the dynamics post processing will include example graphs and more details on how the filters work.
PTI U.S. PSS® User Technical Conference Course
and Workshop Information | April 6-7, 2017 | Summit Days 4-5

New PSS®E Add-on Modules Workshop

**Date**
April 6, 2017 (.5 day)

**Instructor**
Joe Hood – Technical Portfolio Manager

**Description**
This workshop will provide participants with a deep dive into each of the new PSS®E add-on modules; CIM Importer, Model Management, PSS®E-PSCAD™ Data Conversion Module (E-Tran), Data Visualization and Reporting, PSS®E-PSCAD™ Co-Simulation (E-Tran Plus for PSS®E), Advanced Contingency Analysis & RAS Tools, Measurement Interface Module, and Parallel Dynamics. Attendees will be able to follow along with live demonstrations and learn how to get started with each of the modules.

**Course Requirement Instructions**
Bring your company laptop with PSS®E hardware lock/dongle and licensed versions of software preinstalled; PSS®E v33.X or PSS®E 34.X. To follow along with demonstrations, a trial version of each of the new add-on module must be requested 2 weeks before the workshop. Details on how to request module trials will be sent upon registration.

**Cost**
Free of charge

GIC Analysis Using PSS®E (2 Days)

**Date**
April 6-7, 2017 (2 day)

**Instructor**
Krishnat Patil – Senior Staff Engineer

**Description**
NERC Standard TPL-007-1 establishes requirements for transmission system planned performance during geomagnetic disturbance (GMD) events. This course will teach performing power system planning studies using PSS®E GIC module for TPL-007-1 compliance. Geomagnetic induced currents (GIC) calculations data requirements and earth conductivity modeling will be discussed. PSS®E GIC Modeling features like simulating complex GMD storm scenarios, calculating GICs with induced voltages calculated outside of PSS®E, Contingency and Voltage Stability analysis with GIC analysis will be demonstrated.

The course will include hands on exercises to perform GIC analysis, GMD storm magnitude and orientation scan, plot GIC results on Network maps, transformer thermal assessment, and GIC analysis
reports from PSS®E GUI as well as developing Python™ scripts to do the same. If possible and available participants can bring their own network data and corresponding GIC data file to run these exercises with, otherwise these exercises will be run with sample data.

<table>
<thead>
<tr>
<th>Course Requirement</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bring your company laptop with PSS®E hardware lock/dongle and licensed versions of software preinstalled; PSS®E v33.X or PSS®E 34.X. A PSS® GIC Module license is required for this course. Additional Python™ modules will also need to be installed, a list of these modules and installation instructions will be sent before the course.</td>
<td></td>
</tr>
</tbody>
</table>

| Cost | $1,875.00 USD |