Technology Solutions
Booth #3113 Demonstrations
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<tr>
<th>Solution Name</th>
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<td><strong>Strategy and Planning</strong></td>
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| **Grid Modernization Consulting** | As utilities go about modernizing their grids to more digital, automated systems that support the technological, reliability, and security needs of their customers, Siemens PTI offers a full range of services, from technical studies (Power Quality, System Impact, Stability, Protection & Control, etc.) to the development of a comprehensive modernization roadmap using our COMPASS methodology. The unique value of Siemens PTI COMPASS program includes:  
  - The structured methodology that enables a utility to design and implement strategic planning around grid modernization  
  - The confidentiality and efficiency of the strategic planning process  
  - Ability to prioritize investments to meet system upgrade requirements and resource limitations. |
| **Distribution Protection Coordination for high DER Penetration** | Siemens power system simulation software, PSS®SINCAL, has the capability to model the IEEE34 distribution circuit for load flow, DER modeling, short-circuit and protection capabilities while applying increasing levels of DER penetration (20/40/60/80/100%) on to the circuit. The major benefits of this include the ability of planners and protection engineers to work together in a common analytics and modeling tool which increases productivity, drops barriers/silos between groups, and provides managers with superior insight into how the system is affected by variables that cannot be simultaneously studied using other tools. |
| **Integrated Planning** | With the rapid growth of DER and large scale renewable generation, and the desire by many legislators and commissions to incent their continued growth, the need to improve and better integrate the system and supply planning under a single system framework becomes crucial. Siemens PTI, with our 60 years of network planning experience, combines our proven IRP process, utilizing scenarios or stochastics to consider uncertainty, with a robust feeder-level analysis of the distribution system, tied together with the transmission system, to provide a comprehensive, system-wide view of DER impacts, system protection and upgrade requirements, and long-term capital plans. |
| **Cyber Security Services** | Siemens Cyber Security consulting has a breadth of services based on our experience in the Utility landscape delivering and supporting both real-time operational systems and enterprise IT systems. The unique services and value offered by our cyber security services include:  
  - Risk vulnerability assessments to reveal potential security gaps and create a resolution plan  
  - Patch management services to ensure adequate testing of 3rd party software patches before delivery to an online system  
  - NERC-CIP compliance consulting leveraging our experience and broad customer base to help the utility be successful in their next audit  
  - Customer-specific cyber security consulting based on your utility’s security history and IT landscape roadmap |
<p>| <strong>OMNETRIC Group Integration Services &amp; Solutions</strong> | OMNETRIC Group is a joint venture between Siemens and Accenture, the consulting, technology and managed services company. Dedicated to energy providers, we bridge the gap between operations and information technology systems with integration services and innovative solutions leveraging Siemens Energy IP and Spectrum Power. Our solutions and proprietary assets are future-aware, compliant, and secure and can be delivered on premise, in the cloud, or as a managed service. |
| <strong>Interactive Microgrid Design Table</strong> | The Microgrid table is a modern piece of cutting-edge technology to explain Siemens turnkey solution to Microgrid consulting, design, equipment supply, and advance control software. The table is meant to be an interactive conversation piece where end customers’ needs and interests can be discussed with a Siemens expert in an exciting and informative way. |</p>
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<td><strong>Engineering</strong></td>
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| **Substation Automation Products** | With an increasingly digital grid, Siemens breadth of substation automation products includes substation metering, protection, and RTU devices to automate transmission and distribution substations. Siemens products offer a unique value proposition in the market for the following reasons:  
- Powerful: Less devices per station. Support for Multi-Feeder Virtual Relays mean less digital files to maintain, and a simpler station design.  
- Much Safer: Designed for safety with no exposed metals on wire connections  
- Smart Inputs: All CTs and PTs blocks can be removed from the relay  
- Highly Secure: A redundant A/D converter designed to avoid loss of data |
| **Distribution Automation Products** | With an increasingly automated distribution network, Siemens breadth of distribution automation products includes feeder automation controllers and line sensors to monitor and control distribution networks. Siemens products offer a unique value proposition in the market for the following reasons:  
- Reduced Downtime: High availability of overhead line distribution network  
- Efficient Operation: Direct Maintenance Teams to fault-fast fault detection  
- High Accuracy: Reliable detection of high impedance faults  
- Reduced Maintenance Cycle: Reduced dependency on batteries via energy harvesting  
- Cyber Security: Built-IPSec encryption  
- Ease of installation: Hot stick installation on energized lines |
| **Fault Location and Feeder Automation Systems** | With an increasingly distributed network, Siemens decentralized feeder automation system and cloud based fault location increases the accuracy of problem detection allowing quicker restoration times. Siemens products offer a unique value proposition in the market for the following reasons:  
  - Feeder Automation System:  
    - Interoperability: designed to work with all manufacturers’ primary equipment  
    - Cost Effective: decentralized architecture at the edge of the grid  
    - Easy to Program: graphical feeder automation sequence editor (FASE)  
    - Flexibility: jDif™ Protection  
    - Speed of operation: millisecond peer to peer communications  
  - Fault Location System:  
    - Cloud Based: reduced capital and operating costs  
    - Availability: Information is quickly available to operators in the control center or in the field  
    - Efficiency: operators are quickly directed to the trouble area  
    - Easy Configuration: configuration via a QR code and iPhone |
| **Fusesaver™ Medium Voltage Outdoor Circuit Breaker** | Some of the most common causes of blown fuses in the MV network include transient faults. These faults can be caused by a tree limb touching the conductor or from wind creating a transient phase-to-phase fault. Siemens Fusesaver can significantly reduce the headaches of these transient faults. Simply replace overhead fuse with a Siemens Fusesaver which operate as a fused recloser, opening to prevent fuse blows during transient faults and closing in to blow the fuse during sustained faults. The unique benefits of the Fusesaver solution include:  
- Reduced operating expenses due to less fuse replacements and truck rolls  
- Improved reliability metrics due to making a transient fault a slight interruption of customer supply rather than a sustained interruption  
- More visibility: gather and provide reliability data over communications to the operations and dispatch personnel |
### RUGGEDCOM CROSSBOW Asset Discovery & Management

The Siemens RUGGEDCOM CROSSBOW application addresses the need for utilities to interactively access remote field IEDs for maintenance, configuration, and data retrieval. RUGGEDCOM CROSSBOW allows a native IED application to remotely communicate with its associated IEDs, as if the user were directly connected to the IED with a serial cable or network connection. Some of the major benefits of the RUGGEDCOM CROSSBOW Asset Discovery & Management include:

- Ability to discover new devices on substation LANs
- Alerting and auditing capability through integration with CROSSBOW

### RUGGEDCOM Network Edge Intelligence

Communication networks distributed over a wide geographical area – such as those used for smart grids – are often limited to small bandwidths or expensive public networks. Now information can be processed on-site in a virtual environment in the router, thus making room for more devices on the network – a key aspect of the Industrial Internet of Things (IIoT). The new RUGGEDCOM VPE1400 virtual processing engine has both LTE and WLAN access at the network edge combined with virtual machine environment to run 3rd party applications, and a feature rich layer 3 router all contained in a single box solution for rugged environments. The major benefits of the RUGGEDCOM Network Edge Intelligence includes:

- Robust, cost-effective platform solution for 3rd party applications
- Applications can be used to distribute intelligence throughout the network
- Integrated API suite for multi-protocol device communication
- Supports standard Linux-based development platforms

### VersiCharge SG (R)

With the ever-increasing demand for Electric Vehicles (EVs) in sync with the modernization of the grid, Siemens is proud to offer a portfolio of level 2 SmartGrid enabled charging stations and equipment for residential, workplace, and semi-public electric vehicle charging applications. The Siemens VersiCharge SmartGrid electric vehicle charging solution offers a unique value proposition in the EV market for the following reasons:

- Wi-Fi Capable: CTA2045 Wi-Fi module imbedded in the charger to fully execute the desired energy profiles in residential, workplace and semi-public charging environments
- Cellular Capable: in addition to Wi-Fi, the VersiComm node enables charging banks of up to 50 chargers to be securely connected to the cellular network by combining Siemens RUGGEDCOM equipment in a pre-configured Nema 4 rated enclosure
- Business Flexibility: this UL listed, Nema 4 rated level 2 charger provides customers with the flexibility to implement fully networked solutions, pricing strategies via Open ADR 2.0b, or a customized CTA2045 AC module
- Easily deployable: VersiCharge SG is out of the box ready for a wall mounted application, the optional VersiPost is available to turn the station into a cost-effective pedestal charging unit, and tamper resistant provisions are easily added for installations where required.
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<td>Advanced Distribution Management System</td>
<td>Giving operations personnel the tools to be successful, Siemens Advanced Distribution Management System combines the network monitoring and control of SCADA with the outage prediction and restoration of OMS, integrated with the optimization and analysis of DMS. The results and unique value proposition of this integrated but flexible solution are:</td>
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<td>- Improved CAIDI, SAIDI indices through quick crew dispatch and restoration capabilities, leveraging mobile crew platforms and smart meter data</td>
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<td>- Enhance operational safety with switching management applications and mobile device support</td>
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<td>- Resolve network violations and optimize feeder voltage profiles with the distribution management applications, leveraging meter data for state estimation and power flow results</td>
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<td>- Integrate and optimize large scale DERS, including a full model for generation, storage, and controllable loads, Siemens ADMS has all the functionality to manage the DER penetration of today and tomorrow with the end goal of operational excellence and network optimization</td>
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<td>- To enhance the DER Management functions to include program management and control of consumer resources, including: customer/asset registration, contracting, and settlement, Siemens Spectrum Power ADMS seamlessly integrates with our Energy IP DEMS product</td>
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<td>Microgrid Management System</td>
<td>For end customers with on-site generation, both utility and non-utility owned, the Siemens Microgrid Management System (MGMS) ensures system stability in grid-connected and islanded configurations while imbedding economic and emission optimization. Some of the unique differentiators of Siemens MGMS include:</td>
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<td>- Maximizing project ROI, due to the load forecast, renewable generation forecast, and economic optimization of on-site assets and TOU tariffs: the system always selects the least cost configuration</td>
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<td>- Ensuring reliability, when in an islanded configuration MGMS constantly manages and enforces spinning reserves for both frequency and voltage enforcement</td>
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<td>- Integrating to external systems, supporting ICCP and enterprise integration whether it be the distribution system operator's ADMS or the market operator's market management system</td>
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<td>- Managing operational events, configurable operational events that can be autonomously executed such as black start restorations in the event of a grid outage or automatically resynchronizing to the grid as grid power is restored</td>
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<td>Grid Application Platform EnergyIP</td>
<td>Energy IP is the flexible and configurable grid application platform upon which Siemens can deliver our meter data management, decentralized energy management, and grid analytics products. Some of the unique features of the Energy IP Platform include:</td>
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<td>- An advanced database platform for extreme performance and scalability</td>
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<td>- Seamless and proven integration to large-scale CIS and Asset Management systems (e.g. SAP)</td>
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<td>- Web developer toolkit to build your own applications on top of the platform</td>
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<td>- Cloud or On-premise deployment options for ultimate flexibility</td>
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### Decentralized Energy Management System

One of the largest trends in our industry and the future configuration of our grid network consist of decentralized energy generation, storage, and controllable consumption. Siemens Decentralized Energy Management System (DEMS) is a scalable software platform for the aggregation and control of decentralized energy assets. Built on top of the Energy IP platform, Siemens DEMS offers superior performance and scalability. The unique features that Siemens DEMS has to offer includes:

- Individual customer and asset registration, contracting, and settlement for both customer owned generation/storage assets and demand response resources
- Flexible customer and asset aggregation based on geography, network connectivity, and business rules
- Consumer optimization to uphold fair play rules
- To enhance the DER Management functions to include control of large scale utility-owned assets, powerflow analysis, and active network management, Siemens Energy IP DEMS seamlessly integrates with our Spectrum Power ADMS product

### Meter-based Grid Analytics

With the increasing deployment of Smart Meter and AMI projects, there is more potential to expand the project value beyond meter-to-cash. Siemens Grid Analytics is a collection of applications built on top of the Energy IP Platform to expand the value of your Smart Meter investment by leveraging LV meter data to improve grid operation and customer satisfaction. Some of the unique functions of the Energy IP Grid Analytics Suite include:

- Flexible Load Forecasting algorithms to identify aggregate and granular load patterns with support for other operational systems such as an ADMS or DER Management System
- An easy-to-use Equipment Load Management application that identifies loading on specific assets and then prioritizes equipment upgrades based on loading conditions
- Power Quality application leveraging all available data to identify and prioritize pressing power quality issues, including: momentary outages, voltage fluctuations, power factor deviations and more

### Digital Grid Services

A service offering from Siemens in support of the changing IT landscape. Siemens Digital Grid Services encompasses the portfolio of hosted software solutions and support services offered to our customers. Siemens is uniquely positioned to offer the following value to our end customers:

- Experience: with 100+ years working directly with electric utilities comes a strong understanding of their business processes and needs
- Security: Siemens security has the utmost importance for our hosted solutions, ensuring cutting edge solutions for both physical and cyber security risk mitigation
- Reduced operational expenses: both upfront installation costs and ongoing IT maintenance expenses
- More attractive financing: an ongoing operational expense for the software and support rather than a large upfront investment