S&C Electric Company's Smart Grid Product Development, Testing, and Demonstration Facilities

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Several facilities at S&C's World Headquarters in Chicago Illinois USA exemplify the company's unmatched commitment to furthering the intelligent grid:

- The **Smart Grid Solutions Center** showcases S&C's solutions for the self-healing grid. It features a range of underground and overhead distribution products in their true application settings. Visitors can see demonstrations of fault isolation and service restoration, pulseclosing, energy storage, and fast peer-to-peer communication networking.
- **IntelliLab** allows a user to witness factory acceptance testing of their custom-engineered S&C IntelliTeam® SG Automatic Restoration System, to confirm that this software-based solution performs as intended under realistic scenarios simulated for the user's specific distribution system.
- The **Advanced Technology Center** features a world-class high-power testing laboratory which enables S&C to accelerate development and delivery of the highly-sophisticated automatic service restoration, energy storage, and power quality equipment needed for the Smart Grid.

Smart Grid Solutions Center

The 40-foot-by-50-foot Smart Grid Distribution System Demo includes a variety of S&C products, including IntelliRupter® PulseClosers, a Scada-Mate CX™ Switch with 6801 Automatic Switch Control, Remote Supervisory Vista® Underground Distribution Switchgear with 6802 Automatic Switch Control, and an IntelliNode™ Interface Module connected to an SEL 351S Relay. Each switching device features a SpeedNet™ Radio. The radios form a working mesh radio network. IntelliTeam® SG Automatic Restoration System software is the cornerstone of the demonstrations and enables all the hardware and communication components to a function as a unified system.

The switching devices, controls, radios, and software are real and completely functional. The demonstrations are not scripted. They include provisions for simulating short-circuits on feeders, as well as loss of voltage in substations. As such events are created, the switching devices respond accordingly, clearing the fault, isolating the faulted section, and restoring service from one of two alternate sources. Conductors are mated with vibrant LED rope lighting that changes color to show the source serving each section (or goes dark in sections that are not energized).

S&C's PureWave® Community Energy Storage System is integrated into the demonstrations too. When a main line power outage is simulated, the energy storage units literally "keep the lights" on for the loads they serve. The energy storage units are controlled by S&C's IntelliTeam® DEM Distributed Energy Management System.

IntelliLab

IntelliLab is dedicated to factory acceptance testing of a user's IntelliTeam® SG Automatic Restoration System on a model of the user's specific distribution system.

Comprehensive simulations of the IntelliTeam SG System are performed, including a loss-of-voltage event for each source, a fault event in each team, as well as second-contingency events.

The test system runs IntelliTeam SG software on up to 48 control platforms at a time: sixteen 6800 Series Automatic Switch Controls, sixteen IntelliRupter® PulseClosers, and sixteen IntelliNode™ Interface Modules. The IntelliNode Modules can be connected directly to third-party controls or relays from Cooper, Nu-Lec, SEL, or ABB that have demonstrated interoperability with IntelliTeam SG.

Advanced Technology Center

The 43,000-square-foot Advanced Technology Center includes a testing laboratory with two 850-MW electrical short-circuit generators These generators can test up to 100 kA and up to 230,000 volts.

The laboratory allows S&C to perform quality control and development testing of products—including products for the Smart Grid—in Chicago . . . rather than relying on costly, time-consuming visits to test labs in Europe.