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SEL Applies Synchrophasor Technology to Improve Distributed Generation on Oregon Solar Highway Project

PULLMAN, WA — April 8, 2010 — Schweitzer Engineering Laboratories, Inc. (SEL) is working with Oregon's PV Powered, Inc. to improve distributed generation islanding detection with synchrophasors for a photovoltaic (PV) project on the first U.S. solar highway. The partners, including Portland General Electric, Northern Plains Power Technologies, and Sensus, are part of a national initiative to integrate PV generation technologies into the nation's power grid.

Funded by the Solar America Initiative and supervised by Sandia National Laboratories, the Solar Energy Grid Integration System (SEGIS) team is working on the Oregon Solar Highway project, which supplies renewable power for lighting at the Interstate 5-Interstate 205 interchange in Tualatin near Portland. Project managers have indicated that the landmark project opens the way for larger solar highway installations.

"PV-based solar generation is becoming a vital part of the overall distributed generation resources," said Krishnanjan Gubba Ravikumar, an SEL associate power engineer and a SEGIS team member. "Some estimates predict it will make up 14 percent of renewable energy generation by 2020. Key fundamental technology innovations like using synchrophasor measurements are required to allow the pervasive use of renewable distributed generation throughout the grid."

SEL is providing industry-leading synchrophasor technology, which primarily includes phasor measurement units and synchrophasor vector processors performing phasor data concentration and control that prevent unintentional power islanding. Islanding is a condition where a part of the power system consisting of one or more power sources and loads is separated from the rest of the power system for a certain time. The SEGIS project marks one of the first times that synchrophasor technology is being applied for distributed generation.

SEL has developed a new synchrophasor-based islanding detection method that takes precise measurements to consider all load and generation conditions. More accurate system information can help utility operators identify situations when an islanded power system can still stay connected to the grid to help stabilize it. In the Oregon Solar Highway project, the new method will help the PV Powered inverter differentiate between unintentional islanding that doesn't require disconnection and a case where grid separation from the PV plant is required.

PV power generation poses unique challenges because of its intermittent nature, being dependent on sunlight. Integrating sporadic PV power generation into the bulk power grid—while maintaining power quality and reliability—is a key focus of the project.

Generating since December 19, 2008, the 104-kilowatt Oregon Solar Highway PV system produces about 128,000 kilowatt-hours a year, or roughly one-third of the 400,000 kilowatt-hours needed to light the interchange.

For more information on features, benefits, and applications on SEL synchrophasor solutions, visit www.selinc.com/p114.

PV Powered, Inc., founded in 2003 in Bend, Oregon, has assembled one of the most experienced design teams in solar power electronics. Its mission is to demonstrate technical leadership in delivering a maximum solar energy harvest, especially under environmental extremes.

SEL serves the power industry worldwide through the design, manufacture, supply, and support of products and services for power system protection, monitoring, control, automation, and metering. SEL offers unmatched local technical support, a worldwide, ten-year product warranty, and a commitment to making electric power safer, more reliable, and more economical.

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