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AeroVironment Integrates Pacific Northwest National Laboratory Technology into Electric Vehicle Charging Systems to Improve Electrical Grid Stability

- Intelligent plug-in electric vehicle (PEV) charging technology controls charging rate based on grid conditions and aims to reduce electricity cost for plug-in vehicles
- Grid-friendly PEV charging solution delivers benefits to grid operators and drivers

MONROVIA, Calif.--(BUSINESS WIRE)-- AeroVironment, Inc. (NASDAQ: AVAV) and the United States Department of Energy's Pacific Northwest National Laboratory (PNNL), managed by Battelle, today announced a commercial license agreement for a technology that supports widespread adoption of plug-in electric vehicles (PEVs) by helping to stabilize the electrical grid -- the network of electricity generation, transmission and distribution that powers the nation.

AeroVironment integrates Pacific Northwest National Laboratory technology into its EVSE-RS to enable grid-friendly PEV charging (Photo: Business Wire)

The technology may result in lower-cost electricity for plug-in vehicle drivers due to the grid support functions provided during vehicle charging. AeroVironment will use a portion of the licensed PNNL technology in a new prototype version of its industry-leading Level II charging systems.

Wahid Nawabi, AeroVironment senior vice president and general manager of its Efficient Energy Systems (EES) business segment, said, "We are working to broaden the adoption of plug-in vehicles to help achieve America's environmental, economic and energy security goals. While easily and reliably recharging PEVs, this grid-friendly charging system will also improve grid performance, turning PEVs and their chargers into a valuable solution to a broader challenge."

The licensed PNNL technology can help stabilize the electrical grid by continuously monitoring the grid's alternating current (AC) frequency and varying the vehicle charging rate in response. Additionally, in the event of a rapid drop in grid frequency, the charging system stops charging, providing a grid "shock absorber." Such rapid frequency drops, while small in overall magnitude, indicate that a fault condition has occurred somewhere on the grid and that there is an imbalance between load and electricity generation. By reducing load the system can be rebalanced.

Conventional power plants make continual power generation adjustments based on precisely measured grid frequency in order to maintain a nearly constant frequency of 60 cycles per second. As renewable generation sources such as wind and solar grow in overall share, the overall frequency-responsive generation capability provided by conventional power plants is gradually decreasing. AeroVironment and PNNL's frequency-responsive technology brings this same grid frequency support capability to PEV charging stations.

AeroVironment and PNNL share the vision that with millions of plug-in vehicles charging at any given time, modulating the aggregate charging rate of PEVs can help control grid frequency and support the integration of variable renewable generation

sources, such as wind and solar.

"These technologies will result in a triple-win," said Dr. Alec Brooks, chief technology officer of AeroVironment's EES business segment. "First, reducing the cost of integrating variable renewable generation reduces electricity costs for all ratepayers. Second, plug-in cars can be powered by renewable generation that might not have been possible to add to the grid without the charging rate flexibility offered by vehicles and this technology. Third, the reduced cost of electricity to plug-in vehicle drivers will further improve on the cost advantage of driving on electricity as compared to gasoline."

"Vehicle charging infrastructure is important for the market adoption of electric vehicles and plug-in hybrid electric vehicles," said Dan Ton, DOE's program manager of Smart Grid Research and Development. "We need charging stations and we need them to be intelligent in order to work with smart vehicles and smart grid infrastructure to avoid potential strain on the grid and to provide flexible billing transactions for energy and grid services."

Prototypes of the new AeroVironment charging system are available immediately for beta testing. The prototypes include Bluetooth wireless connectivity for data streaming and local control functions. Contact sales@avinc.com for information.

About AeroVironment, Inc.

AeroVironment is a technology solutions provider that designs, develops, produces, operates and supports an advanced portfolio of electric transportation solutions and electric-powered Unmanned Aircraft Systems (UAS). AeroVironment's power cycling and test systems provide EV developers and EV battery manufacturers with market-leading simulation and cycling capabilities. AeroVironment's industrial electric vehicle charging systems support thousands of electric materials handling vehicles in mission-critical supply chains for Fortune 500 enterprises. AeroVironment's comprehensive EV charging solutions include EV home charging, public charging, fast charging, data collection, grid-integrated communications and complete installation, training and support services for consumers, automakers, utilities, government agencies and businesses. Agencies of the U.S. Department of Defense and allied military services use the company's electric-powered, hand-launched unmanned aircraft systems to provide situational awareness to tactical operating units through real-time, airborne reconnaissance, surveillance and communication. More information is available at www.avinc.com and www.evsolutions.com.

About Pacific Northwest National Laboratory

Interdisciplinary teams at Pacific Northwest National Laboratory address many of America's most pressing issues in energy, the environment and national security through advances in basic and applied science. PNNL employs 4,500 staff, has an annual budget of nearly $1 billion, and has been managed for the U.S. Department of Energy by Ohio-based Battelle since the laboratory's inception in 1965. For more information, visit the PNNL News Center, or follow PNNL on Facebook, LinkedIn and Twitter.

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AeroVironment, Inc.
Steven Gitlin, +1-626-357-9983
pr@avinc.com
or
Battelle & Pacific Northwest National Laboratory

Greg Koller, +1-509-372-4864
greg.koller@pnnl.gov

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