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INFINITE POWER SOLUTIONS LANDS DESIGN WIN AND AIDS INNOVATION AT MICROSTRAIN FOR WIRELESS MONITORING OF ROTORCRAFT COMPONENTS USING ENERGY HARVESTING

THINERGY Micro-Energy Cells Deployed in First Successful Flight Test of an Energy Harvesting Wireless Sensor Network for Military Helicopters

Littleton, Colo., November 16, 2010—Infinite Power Solutions, Inc. (IPS) today announced that it has secured a design win for its award-winning THINERGY® solid-state, rechargeable, Micro-Energy Cell (MEC) product with MicroStrain, Inc., a leading supplier of micro-miniature, highly durable sensors and sensing systems for use in structural health monitoring. IPS' THINERGY MECs have been incorporated into a comprehensive wireless sensor network developed by the Williston, Vt.-based MicroStrain to monitor and manage the health, safety and readiness of rotating helicopter structural components. The system has been successfully demonstrated aboard a Sikorsky MH-60S helicopter and represents the first successful flight test of an energy harvesting wireless sensor network for military aircraft. This project was sponsored by the U.S. Navy's Naval Air Systems Command (NAVAIR). The goals were to increase safety and rotorcraft component life as well as to significantly reduce rotorcraft operational costs.

The mechanical rotation of helicopter rotors makes it impossible to add interconnecting wires to provide power and communications between sensors that are used to monitor the structural performance of rotorcraft components. Slip rings have been used with various levels of success. This drives the need for wireless sensors that can be embedded directly and permanently into the rotorcraft components. To meet this demand, MicroStrain has employed "self-powered" wireless sensor nodes using vibration energy harvesting.

Vibration energy, which is abundant on board a helicopter, is converted to small pulses of electrical energy and efficiently stored in the THINERGY MEC. Extremely powerful for its size, the tiny MEC is then used to power the sensor electronics, including a radio transmitter for RF communications. Because the MEC can be recharged countless times it doesn't need to be replaced like conventional batteries, allowing the entire wireless sensor node to be deeply embedded for years of maintenance-free operation.

According to MicroStrain President and CEO Steve Arms, "Working with THINERGY MECs has greatly helped our innovations in energy harvesting and enabled us to deeply embed sensors to monitor structural health in areas that had previously not been possible. For the first time on military aircraft, we're collecting data in flight from a range of wireless structural sensors, including strain gauges, load cells, accelerometers and angular rate

sensors. The system self-configures its RF transmission schedules and supports a wide range of user-programmable sample rates and duty cycles.”

IPS’ THINERGY MECs were selected as the preferred energy storage solution for this system due to their paper-thin form factor (low mass and volume), low current recharge efficiency (enabling recharge via energy harvesting), high discharge rate (supporting the ability to power RF transmissions) and long life.

“We are pleased to have MicroStrain join our growing list of satisfied customers who recognize and embrace the advantages of our THINERGY MECs, and are leveraging our micro-energy storage products to gain a competitive performance advantage in their systems,” commented Tim Bradow, vice president of marketing. “Our products offer distinct performance, efficiency and lifetime advantages over conventional batteries and supercapacitors, especially when combined with energy harvesting, and enable a variety of self-powered applications—including structural health monitoring and machine condition-based maintenance. This is clearly demonstrated by MicroStrain’s system for wireless monitoring of rotorcraft components.”

This energy harvesting wireless sensor system represents a significant advancement for monitoring of rotary wing aircraft, and has broad applications for fixed wing aircraft, autonomous robots, unmanned vehicles, bridges, buildings, wind turbines and heavy machinery.

Infinite Power Solutions will be exhibiting and demonstrating its unique THINERGY MECs and energy harvesting solutions at Energy Harvesting and Storage USA 2010 in Cambridge, Mass. (booth #1) being held November 16-17, 2010. Microstrain will also be exhibiting at this event (booth #10) and will be demonstrating their rotorcraft energy harvesting based wireless sensor system employing the THINERGY MEC solution.

About Infinite Power Solutions (www.InfinitePowerSolutions.com)

Infinite Power Solutions, Inc. (IPS)—a U.S. clean-technology company—is a global leader in manufacturing solid-state, rechargeable, thin-film micro-energy storage devices. Founded in 2001, IPS is privately held with corporate headquarters and volume manufacturing in Littleton, Colo. The company is the only ISO 9001 certified manufacturer of solid-state, thin-film batteries and its energy storage products provide unrivalled performance, size and service life to displace conventional coin cells, supercapacitors, and other micro-batteries in a variety of applications. THINERGY® Micro-Energy Cell (MEC) and INFENERGY® Micro Power Module (MPM) products provide unprecedented efficiency in micro-energy storage and uniquely enable ambient energy-harvesting solutions to create miniature, autonomous, perpetual power supplies.

About MicroStrain, Inc. (www.Microstrain.com)

MicroStrain, Inc is a privately held corporation based in Williston Vermont. MicroStrain produces smart, wireless, micro-miniature displacement, orientation and strain sensors. Applications include advanced automotive controls, health monitoring, inspection of machines and civil structures, smart medical devices and navigation/control systems for unmanned vehicles, and energy harvesting technologies.

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