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## **Industrial Electric Motors— Wireless Motor Sensors Developed at University of California, Riverside *Brithinee Electric funds program with far-reaching potential.***

**Colton, California, March 12, 2009**—Small motor sensors for large industrial electric motors, a revolutionary development in the field of motor efficiency management, is being developed by a team of engineers at the University of California at Riverside’s Bourns College of Engineering,

Led by V. Sundararajan, assistant professor of mechanical engineering, the team (Xin Xue, Luis Gonzalez, Rafael Garcilazo, and Miaogen Zhang) is developing small, inexpensive nodes. These “Wireless Motor Sensors” continually monitor the electric current, motor vibration, sound and temperature in motors, all critical issues for “motor health.”

The nodes actually harvest their own energy from the motor’s magnetic field. Then, these sensors wirelessly transmit the information outside the motor to a receiving unit, which in turn sends the information to a computer. The node is about the size of a fingernail, for easy placement inside the motor. Little or no maintenance is required. Housing for the sensor is still in the process of being developed.

As larger motors have been developed over the years, motor control systems have become high-tech computer driven systems for start-up, shut-down, and running efficiency. These innovative in-motor sensors provide high-tech feedback to the computer hardware that runs them. Furthermore, understanding a motor’s inner elements can help catch problems before they cause motors to falter, causing greater damage.

These new tools can also accurately diagnose causes of failure, increasing repair quality and customer satisfaction. This is a potential breakthrough, allowing factories, and other large users of motors, to be better able to monitor motors, creating an opportunity to plan for replacements and schedule repairs—keeping production lines running and remote pumping stations working; thereby increasing the efficiency of motors, in general.

The project is being partially funded by Brithinee Electric, an electric motor repair company located in Colton, CA. Graduate student from Shanghai, China, Xin “Crystal” Xue has been field-testing at Brithinee Electric, and is involved in evaluating the data output from the sensors in the Colton facility. Brithinee Electric is the leading motor repair, sales and custom motor control systems provider in Southern California. Co-founders, Don and Wally Brithinee, have long been interested improving reliability of repair methods, motor efficiency and industry standards. Supporting new university research to create wireless motor sensor monitors is just

another way, in a 45-year effort, to improve motors and motor repairs. “We have seen a need, and are excited at the prospects of better solutions to monitor motor systems. Motors are so critical to modern life, that we are extremely pleased to contribute to this developing technology,” states Wally Brithinee. “We hope to be the first to install these new sensors commercially.”

Electric motors play a large part in the modern economy. They pump water, run factories, and provide heating and cooling to most structures. Not surprisingly, commercial motors consume an enormous percentage of electricity. The annual cost of electricity to run these larger motors is several times the cost of the motor. Any small improvement in efficiency creates great benefits to power consumption, costs, and our environment.

Sundararajan and his team at UCR hope to complete the project sometime in 2010. This contribution to electric motor efficiencies is a positive contribution to increasing the energy efficiency and productivity in thousands of motors worldwide.

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