Boeing Working to Develop Flywheel Technology for Utility Companies

The U.S. Department of Energy (DOE) last week announced the selection of six new energy-saving projects designed to accelerate the commercialization of environmentally friendly high-temperature superconductivity technology. The Boeing Company is interested in developing one of these -- an energy storage system that will be of use to the electric power industry.

Under a program called the Superconductivity Partnership Initiative (SPI), the DOE works with companies such as Boeing to develop advanced power delivery technologies that increase the efficiency, reliability and capacity of electric power systems.

"Low-loss, high-capacity small-size utility equipment based on high-temperature superconductors will improve performance and reliability of electricity delivery," said Christine Platt, U.S. Department of Energy SPI program manager.

"Flywheels based on frictionless superconducting bearings will improve power quality and reliability. Blinking VCR lights, computer crashes and power outages such as that of Summer 1996 could become a thing of the past."

If negotiations are successful, Boeing will develop a flywheel energy storage system at the Phantom Works, the companyís advanced research and development unit that specializes in meeting technology challenges by offering innovative and affordable solutions to customers. The system will help utility companies and other large power users eliminate power surges that often disrupt reliable transmission of power.

"Phantom Works is uniquely qualified to develop a superconducting flywheel energy storage system," said Michael Strasik, Flywheel program manager. "Boeing has been working on the technology for a number of years and holds patents on some of the key design features. We intend to draw on our industry-leading expertise both in high temperature superconductivity crystal processing and the manufacture of high-strength composite materials to develop a prototype."

Hal Ahlstrom, Boeing Information, Space & Defense Systems chief engineer, said that the technology has a wide range of applications.

"Flywheels can be very important to space also," Ahlstrom said. "Boeing has had a leading role in the push to use flywheels in satellites and to replace batteries in the International Space Station. The reason is because flywheels wonít wear out like batteries. Batteries fail after a limited number of charge/discharge cycles. By simply replacing batteries with flywheels, you can extend the life of some satellite systems."

According to Strasik, Boeing already has developed a smaller proof-of-concept flywheel energy storage system. This prototype will be used as the basis for developing the larger flywheel system. The smaller proof-of-concept unit is being tested and evaluated for possible use in space applications.

"Not only is the system environmentally compatible," Strasik said, "but it eliminates most of the disadvantages inherent with the use of conventional batteries."

Partnering with the Department of Energy will provide Boeing with the opportunity to develop the more rugged system that is required by utility companies.

Past SPI partnerships have produced motors, current controllers, generators and power cables, all of which have set world performance records.

Boeing project partners include Intermagnetics General Corporation; Praxair Corporation; Cryenco, Inc.; Ashman Technologies; Southern California Edison; and Argonne National Laboratory.

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For further information:
Beverly Weiss
(253) 773-0923
Dave Phillips
(314) 232-1372