

What's New in the World of Superconductivity (September)

Power

American Superconductor Corporation and the Tennessee Valley Authority (September 13, 2005)

American Superconductor Corporation and the Tennessee Valley Authority (TVA) have announced that R&D Magazine has selected the SuperVAR® dynamic synchronous condenser as one of the past year's most technologically significant products, receiving the magazine's prestigious R&D 100 Award. The SuperVAR dynamic synchronous condenser uses superconductor technology to stabilize grid voltages, increase service reliability, and to help maximize transmission capacity. TVA installed an advanced prototype of American Superconductor's SuperVAR condenser at an electrical substation serving a steel mill in August 2004. Since then, the SuperVAR machine has been helping to stabilize the grid's voltage by injecting or absorbing reactive power, as needed. Greg Yurek, president and CEO of American Superconductor, commented, "This is particularly timely since the Energy Policy Act of 2005, recently signed by President Bush, highlights the need for increased investment in the reliability and modernization of the nation's transmission grid, including mandatory reliability standards. We expect SuperVAR machines to play a substantial role in meeting the new and enforceable reliability standards."

Source:

"High Temperature Superconductor Power Grid Stabilization Product Recognized for Technical Excellence -- Selected for R&D 100 Award"

American Superconductor Corporation press release (September 13, 2005)

http://phx.corporate-ir.net/phoenix.zhtml?c=86422&p=irol-newsArticle_Print&ID=755624&highlight

Brookhaven National Laboratory (September 14, 2005)

Researchers at the Brookhaven National Laboratory have discovered a way to significantly increase the amount of electric current carried by YBCO superconductors. The scientists examined several factors that tend to limit current in actual devices and found that surface roughness can actually significantly increase the current-carrying capacity. By depositing YBCO onto a substrate prepared with two distinct areas, a rough region and a smooth region, they were able to directly compare the behavior of the YBCO film on both surface types using electrical-transport measurement techniques and magneto-optical imaging. Surprisingly, the current in the YBCO film deposited on the rough substrate was 30% higher than that deposited on the smooth substrate. Thus, metal substrates with some degree of roughness may actually improve the performance of high-temperature superconductors. The results are further explained in the September 12th online edition of Applied Physics Letters.

Source:

"Helping out a high-temperature superconductor"

Brookhaven National Laboratory press release (September 14, 2005)

http://www.bnl.gov/bnlweb/pubaf/pr/PR_display.asp?prID=05-88

American Superconductor Corporation (September 20, 2005)

American Superconductor Corporation (AMSC) has received a new order for three D-VAR® systems (Dynamic VAR) to be installed in a Canadian mining facility. The 12-MVAR systems will be used to manage voltage conditions, improving the reliability and quality of the electrical power needed to increase industrial productivity and prevent plant shut downs caused by voltage sags. Chuck Stankiewicz, vice president and general manager of AMSC's Power Electronic Systems business unit, commented, "A momentary drop or sag in voltage can be very costly since it can halt the manufacturing process. Remote mining operations are susceptible to low voltage problems, which cause equipment outages, because they are often located at the end of long radial transmission lines." The D-VAR systems are scheduled for shipping in the company's third and fourth quarters of fiscal year 2006. The order represents the eighth D-VAR sale in Canada and the 40th worldwide

Source:

"Canadian Mining Facility Orders Three D-VAR(R) Systems from American Superconductor"

American Superconductor Corporation press release (September 20, 2005)

http://phx.corporate-ir.net/phoenix.zhtml?c=86422&p=irol-newsArticle_Print&ID=758520&highlight

Nexans SuperConductors GmbH (September 21, 2005)

Nexans SuperConductors GmbH has supplied Siemens AG's Corporate Technology division with a contactless HTS bearing for industrial applications. Siemens recently started operating a 4 MVA generator (containing a rotor with an HTS magnet) designed for ship propulsion. The HTS bearing will hold the rotor equipped with permanent magnets in contactless suspension, enabling a nominal load of 500 kg. The HTS magnet maintains the shaft in a stable position through levitation and counterbalances radial and lateral forces. The HTS bearing is currently undergoing tests at Siemens; it has been cooled to -245 °C, supported a load of up to 690 kg, and can withstand engine speeds of up to 3,600 revolutions/min. The rotor operates in a "warm bore" with a bearing gap of just 1 mm in width.

Source:

"Nexans supplies the world's first high temperature superconductor contactless bearing to go on test for an industrial application"

Nexans press release (September 21, 2005)

<http://www.nexans.fr/internet/Content.nx?f=h&contentId=6464>

American Superconductor Corporation (September 28, 2005)

American Superconductor Corporation (AMSC) has received an order for three PowerModule™ PM1000 power electronic converters from Hydrogenics Corporation, a fuel cell developer and manufacturer. The power electronic converters will be used in the propulsion system of a full-size, forty-foot (approximately 12-meter) transit bus that will be initially demonstrated in Winnipeg, Manitoba (Canada). The bus will be the first in Canada to be powered by a hybrid configuration of fuel cells and ultra capacitors. Each of the power converters will manage and regulate the electricity produced by the three fuel cells and will regulate power for the bus's electric drive system. The project, which is being funded by the Canadian government's Department of Natural Resources, will be completed by spring 2006. AMSC's PM1000 power electronic converters have been used in a range of applications from

renewable energy to military applications. Nearly 1000 converters have been used successfully on the power grid and at industrial sites in North America and Europe over the last five years.

Source:

“American Superconductor Receives Order for PowerModule™ Electronic Converters to Be Utilized in Fuel Cell System for Hybrid Electric Bus”

American Superconductor Corporation press release (September 28, 2005)

http://phx.corporate-ir.net/phoenix.zhtml?c=86422&p=irol-newsArticle_Print&ID=761853&highlight

NMR

Oxford Instruments Superconductivity (September 9, 2005)

Oxford Instruments Superconductivity has announced that the world's first commercial 950 MHz magnet is now being prepared for delivery to Oxford University in September 2005. The system will be used by the university's NMR Protein Structure Group to collect and analyze data on biomolecules over 100 kDa in size. In tests conducted so far, the system is performing excellently, with a base drift rate of less than 5 Hz per hour (this is a fundamental parameter for long-term biomolecular NMR experiments and crucial to obtaining high-quality data). The magnet also validates Oxford Instruments' new, proprietary niobium-based superconductor, which was developed to enhance the critical current density capacity (J_c). This additional J_c is crucial, as it enables the development of compact Ultra High Field NMR magnet systems.

Source:

“Oxford Instruments announces the world's first 950MHz magnet for Nuclear Magnetic Resonance is at field”

Oxford Instruments Superconductivity press release (September 9, 2005)

<http://www.nmr magnetsdirect.com/pr3.htm>

Communication

Superconductor Technologies Inc. (September 7, 2005)

Superconductor Technologies Inc. (STI) has extended an existing general purchase agreement with a major wireless carrier in the United States. The agreement was extended for almost three years, modifying the term to last through till early 2008, and will now include STI's SuperLink™ product and all of STI's new products, including AmpLink™ and SuperPlex™. All of STI's products are compatible with existing and currently planned future wireless network technologies. Jeff Quiram, STI president and chief executive officer, commented, “STI anticipated the demand for improved performance by wireless networks as operators roll out EV-DO and other data architectures. We introduced the AmpLink, SuperPlex and enhanced duplexer lines in 2004, and these products are beginning to show traction with our customers. We have further provided customization of these products to meet our customers' unique needs and applications. We look forward to continued success with this major CDMA wireless carrier through the remainder of 2005 and beyond as it expands its high quality wireless network.”

Source:

“Superconductor Technologies Inc. Extends Agreement With Major CDMA Wireless Carrier”

Superconductor Technologies Inc. press release (September 7, 2005)

<http://phx.corporate-ir.net/staging/phoenix.zhtml?c=70847&p=irol-newsArticle&ID=753372&highlight>

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