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

Power

American Superconductor Corporation (January 6, 2009)

American Superconductor Corporation has received its first order for a 16 MegaVAR D-VAR system to meet the dynamic reactive compensation requirements for a 220-kV power transmission grid in Inner Mongolia, China. The reactive power compensation will be used to stabilize the voltage, relieve power grid congestion, improve electrical efficiency, and prevent blackouts in the power grid. The order was placed by Beijing SNTA Electric Power Technique Company, Ltd., who will install the system in a substation that is connected to seven wind farms producing a total of 600 MW of power. The D-VAR will ensure reliable operation of the power grid served by this substation and enable the secure transmission of wind-generated electricity to load centers. The D-VAR solution is scheduled for delivery to SNTA by mid 2009. Greg Yurek, founder and Chief Executive Officer of AMSC, commented, "As China builds out and upgrades its power grid to meet the demands of its rapidly growing economy, it is seeking cutting-edge energy technologies that will meet these demands rapidly and in the most effective way possible. Our solutions meet these requirements, and we expect strong growth in the Chinese power grid market for many years to come."
Source:
"AMSC Receives First Order for Chinese Power Grid"
American Superconductor Corporation press release (January 6, 2009)
http://phx.corporate-ir.net/phoenix.zhtml?c=86422&p=irol-newsArticle_Print&ID=1240673&highlight

American Superconductor Corporation (January 8, 2009)

American Superconductor Corporation has received an order for its D-VAR "STATCOM" reactive compensation solution from Basin Electric Power Cooperative, one of the largest electric generation and transmission cooperatives in the United States. The turnkey D-VAR solution will be deployed near Wright, Wyoming, and will be used to provide steady state and transient voltage support to maintain transmission system stability and reliability in the region. The system will have a continuous rating of 34 MVAR and a short-term rating of 91 MVAR, making it one of the largest STATCOMs ever to be deployed in North America. The system is scheduled to begin operation by the end of calendar 2009.
Source:

"AMSC Receives Turnkey D-VAR® Order for the North American Power Grid"

American Superconductor Corporation press release (January 8, 2009)
http://phx.corporate-ir.net/phoenix.zhtml?c=86422&p=irol-newsArticle_Print&ID=1241923&highlight

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Southwire Company (January 10, 2009)

Southwire Company and its partners (American Electric Power [AEP], American Superconductor Corporation, Oak Ridge National Laboratory, and Praxair) have reported that the HTS Triax® superconducting cable system installed in AEP's Bixby substation in Groveport, Ohio, will celebrate two and a half years of operation on February 6, 2009. The 200-m HTS cable has been distributing electric power to 8,600 homes and businesses throughout the period of the cable's operation. During this period, the system experienced more than 75 transient events, including lightning strikes; most of these events were through-faults. No changes in system temperature or pressure were recorded as a result of these events, and the system has operated continuously with no downtime during the two and a half year period of its operation. David Lindsay, Southwire's Director of Engineering, Distribution Applications, commented, "Using second-generation [HTS] cable design and recent advances in cooling technology, the Bixby installation proves the reliability of HTS Triax Superconducting Cable systems in reducing the cost of high-efficiency power distribution in an urban setting."

Source:

"HTS Triax Superconducting Cable brings more power to more people"

Southwire Company press release (January 10, 2009)

http://www.southwire.com/processGetArticle.do?commonId=bf229534774fe110VgnVCM1000002702a8c0____

American Superconductor Corporation (January 13, 2009)

American Superconductor Corporation and Northrop Grumman Corporation have announced the successful completion of the full-power testing of the world's first 36.5-MW HTS ship propulsion motor at the U.S. Navy's Integrated Power System Land-Based Test Site in Philadelphia. The test represents the first successful full-power test of an electric propulsion motor sized for a large Navy combatant ship; furthermore, with a rating of 36.5 MW, the motor doubled the Navy's power rating test record. The HTS motor was designed and built under a contract from the Office of Naval Research to demonstrate the efficacy of HTS motors for future Navy all-electric ships and submarines. The testing was funded and led by Naval Sea Systems Command (NAVSEA). The HTS motor is less than half the size of conventional motors for ships of comparable size and will reduce the total ship weight by 200 metric tons. Dan McGahn, senior vice president and general manager of AMSC Superconductors, commented, "The successful load test of our HTS motor marks the beginning of a new era in ship propulsion technology. This motor provides the U.S. Navy with a truly transformational capability relative to size, stealth, endurance and survivability, providing our Navy with a clear performance advantage for years to come. We are grateful for the steadfast support from the Office of Naval Research, Naval Sea Systems Command and the Naval Surface Warfare Center." Overall, the Navy has invested more than $100 million in the development of HTS technology for ship propulsion.

Source:

"AMSC and Northrop Grumman Announce Successful Load Testing of 36.4 Megawatt Superconductor Ship Propulsion Motor"

American Superconductor Corporation press release (January 13, 2009)

http://phx.corporate-ir.net/phoenix.zhtml?c=86422&p=irol-newsArticle_Print&ID=1243844&highlight

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Zenergy Power (January 16, 2009)

Zenergy Power plc has been granted a core patent in Germany related to its HTS induction heater. The patent covers a key operating process that governs the exceptional heating control, performance, and overall productivity of the HTS device. With the granting of this patent, a key design specification enabling significant increases in the industrial outputs of HTS induction heaters will now be protected.

Source:

“Induction Heater Patent”

Zenergy Power plc press release (January 16, 2009)

http://www.zenergypower.com/images/press_releases/2009-01-16-induction-heater-patent.pdf

American Superconductor Corporation (January 20, 2009)

American Superconductor Corporation (AMSC) has reported preliminary financial results for the third quarter of fiscal 2008, ending December 31, 2008. AMSC expects third-quarter revenues to fall within the range of US $40 million to $41 million, in line with previous forecasts. The net loss for the third quarter is expected to be between $8.0 million and $9.0 million, which is higher than previously forecasted for several reasons including the effects of unfavorable foreign exchange rates. AMSC continues to expect revenues for full-year fiscal 2008 to be within a range of $175 million to $185 million, and full-year revenue is expected to increase to more than $225 million for fiscal 2009. The company expects to generate a GAAP profit in the fourth quarter of fiscal 2008 and predicts that it will be profitable for full-year fiscal 2009.

Source:

“AMSC Provides Preliminary Third Quarter Financial Results”

American Superconductor Corporation press release (January 20, 2009)

http://phx.corporate-ir.net/phoenix.zhtml?c=86422&p=irol-newsArticle_Print&ID=1246456&highlight

American Superconductor Corporation (January 22, 2009)

American Superconductor Corporation (AMSC) has received a multi-million-dollar order from China's CSR Zhuzhou Electric Locomotive Research Institute Co., Ltd. (CSR-ZEKRI) for 100 sets of core electrical components, including AMSC’s proprietary PowerModule™ PM3000W power converter, for use in wind turbines. The components will be used in the production of the 1.65-MW wind turbines that were designed by AMSC Windtec®. The components are scheduled for shipment by the end of calendar 2009 and will be used to support CSR-ZELRI’s increased production of wind turbines. Greg Yurek, founder and chief executive officer of AMSC, commented, "CSR-ZELRI has done a tremendous job of ramping up production of high-quality wind turbines in a very short time. We expect CSR-ZELRI to continue its rapid growth and to take a significant share of the Chinese wind turbine market in the years ahead."

Source:

“China’s CSR-ZELRI Orders 100 Sets of Wind Turbine Core Electrical Components from AMSC”

American Superconductor Corporation press release (January 22, 2009)

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http://phx.corporate-ir.net/phoenix.zhtml?c=86422&p=irol-newsArticle_Print&ID=1247122&highlight

American Superconductor Corporation (January 27, 2009)

American Superconductor Corporation has received an order for a large-scale dynamic reactive compensation solution (D-VAR®) from National Grid, an energy company that manages the electricity network on Long Island under an agreement with the Long Island Power Authority (LIPA). The D-VAR STATCOM solution will be installed on the eastern side of Long Island to provide the reactive power compensation required to stabilize the voltage, relieve power grid congestion, improve electrical efficiency, and prevent blackouts, thereby ensuring the continued reliability of the local power grid. Long Island Power Authority President and Chief Executive Officer, Kevin S. Law, commented, "In order to continue providing reliable, high quality power, we needed a solution to stabilize voltage during times of peak demand, particularly over the summer months when Long Island's population is at its highest." AMSC will provide a full turnkey solution, including the installation of a 36 MVAR base-rated D-VAR STATCOM and ongoing maintenance and support for LIPA. The system is scheduled for commissioning in mid 2010. The order represents the second D-VAR solution to be installed in a LIPA power grid.
Source:
“AMSC Announces Turnkey D-VAR® Order for Long Island Power Grid”
American Superconductor Corporation press release (January 27, 2009)
http://phx.corporate-ir.net/phoenix.zhtml?c=86422&p=irol-newsArticle_Print&ID=1248613&highlight

Basic

Boston College (January 27, 2009)

Researchers at Boston College, in collaboration with Tohoku University (Japan) and the National Laboratory for Condensed Matter Physics (China), have reported that the pseudogap does not disappear with the onset of superconductivity but rather persists and co-exists with superconductivity, possibly even competing with the phenomenon. Using scanning tunneling microscopy and angle-resolved photoemission spectroscopy to observe Bi2201, the researchers discovered that the pseudogap does not merely precede superconductivity but instead continues to co-exist once the material begins to superconduct. Furthermore, the group believes that the pseudogap’s presence may draw electrons away from the superconductor gap; in other words, the pseudogap might be competing with superconductivity. The researchers plan to continue studying the exact nature of these possibly competing states. The group’s research was published in the journal *Physical Review Letters*.
Source:
“The pseudogap persists as material superconducts”
Boston College press release (January 27, 2009)
http://www.bc.edu/bc_org/rvp/pubaf/09/MadhavenPseudogap.pdf

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Massachusetts Institute of Technology (January 27, 2009)

Researchers at Massachusetts Institute of Technology (MIT), in collaboration with Nagoya University (Japan) and Brookhaven National Laboratory, have discovered that several high-temperature superconductors exhibit atomic-scale variations in a property known as the Fermi surface. Such variations have never before been seen in any kind of material. The Fermi surface is a measurement of the distribution of electrons in a material. Until now, the Fermi surface was thought to be uniform throughout any material. Using scanning tunneling microscopy and quasiparticle interference, the MIT researchers observed atomic variations in the surface of two bismuth-based superconductors. While these variations may merely represent an oddity, they might serve as an important clue for physicists working to understand why a broad new class of materials, known as strongly correlated electronic materials, exhibits exotic properties, including high-temperature superconductivity. The group's research was published online in the January 25th edition of *Nature Physics*.

Source:
"Physicists discover surprising variation in superconductors"
Massachusetts Institute of Technology press release (January 27, 2009)
http://web.mit.edu/newsoffice/2009/superconduct-0127.html

(Akihiko Tsutai, Director, International Affairs Division, ISTEC)

Top of Superconductivity Web21