

## Spotlight on New Sustaining Member

# SuperPower, Inc. Reports World Records, Progress to DOE



SuperPower, Inc. reported a number of new milestone achievements and world-record performances at the 2009 US Department of Energy (DOE) Annual Peer Review of Superconductivity for Electric Systems held in Alexandria VA in August. SuperPower Chief Technology Advisor Dr. Venkat Selvamanickam, along with John Dackow, director of operations, and Dr. Yi-Yuan Xie, director of product engineering, communicated a number of significant new achievements in product performance, length, production improvements and enhanced product configurations. These milestones are strongly tied to the DOE mission, which encourages development of second-generation high temperature superconducting (2G HTS) wires that meet all the necessary requirements of systems that are being constructed to modernize the electric power grid and enhance the reliability and security of the nation's energy infrastructure.

Dackow reported a new world record wire performance achievement that maintains SuperPower's leading position in the area of 2G HTS wire. "SuperPower is pleased to report that it has once again broken its own world performance record with the production of a wire 1,065 meters in length that carries a minimum current of 282 amperes. This has resulted in a new record-high wire performance of 300,330 amp-meters," said Dackow. The previous world record, reported at the August 2008 Applied Superconductivity Conference in Chicago was for a 1,030-meter-long wire that carried 227

amperes, resulting in the 233,810 amp-meter record.


SuperPower has reorganized its technology development and manufacturing organizations. Selvamanickam has joined the faculty at the University of Houston as the M. D. Anderson Chair Professor of Mechanical Engineering, and the company has consolidated its technology development operations in Houston, thus enabling total focus on manufacturing in Schenectady under the leadership of Dackow.

SuperPower executed a research agreement with the University of Houston in December 2008 to jointly develop with the Texas Center for Superconductivity at University of Houston (TcSUH) the next level of performance improvements, high efficiency processes and advanced wire architectures. As of February 2009 full technology development operations have resumed under the direction of Selvamanickam in his roles as principal investigator at TcSUH in the research collaboration, as well as the chief technology advisor for SuperPower.

A number of technological advancements were reported, including consistent demonstration of wires with a two-and-one-half-times improved infield performance with high uniformity. Selvamanickam noted that, "Based on the research at Houston involving TcSUH and SuperPower scientists, with support from Oak Ridge National Laboratory and Argonne National Laboratory (both CSA Corporate Sustaining Members), an optimum process recipe was developed to fabricate wires with improved in-field performance. This process was then successfully transitioned from Houston to Schenectady to enable the manufacture of wire in lengths of several hundred meters."


Over a wire length of 300m, 28 percent retention in critical current was achieved in a field of 1 Tesla at 77K which is two and one-half times better than that of standard wires. Additionally, this level of performance was found to be uniform within three percent over long wire lengths. This achievement enabled SuperPower to demonstrate coils which generated a magnetic field of 2.5 T at 65K, exceeding the FY09 Annual Performance Target of 2 T established by the DOE in the effort to maintain progress in achieving increasingly powerful coils for electric power applications such as transformers and motors."

SuperPower also reported a new world record achieved in high field insert coils [see page 17 for details] and progress in its Superconducting Fault Current Limiter program.



## Designers and Manufacturers of Specialty Cryogenic Equipment

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- Specialty Liquefiers  
- H<sub>2</sub>, N<sub>2</sub>, CH<sub>4</sub>, etc.
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- Cryogenic Heat Exchangers
- Cryogenic Pumps
- Beamline Coolers
- Superfluid Helium Systems
- Superconducting Magnet Cryostats
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