

Fuel Cell Demonstration Advances Technology for Military Applications GTI Operates Solid Oxide Fuel Cell on Military Logistics Fuel

Des Plaines, IL – December 15, 2005 – Gas Technology Institute (GTI) has demonstrated operation of a high-power-density solid oxide fuel cell (SOFC) breadboard system using real-world military logistics fuel (JP8) containing 600 to 700 ppm of sulfur. This marks a key milestone on the path to developing SOFC technology that can provide efficient, quiet, and clean power for military applications. The work is funded through the U.S. Department of Defense/Construction Engineering Research Laboratory (DOD/CERL). U.S. Senator Richard Durbin of Illinois played a critical role in establishing this breakthrough program to support defense-related fuel cell research.

The GTI-developed JP8-fueled SOFC generation concept uses an innovative steam reforming process that tailors the product gas for the SOFC stack, enabling effective thermal management which is key to achieving high system efficiency. The JP8 fuel processor uses an advanced sulfur tolerant catalyst, novel JP8 burner, and radiant heat transfer system to convert JP8 military logistics fuel into hydrogen and other key product gases used by the SOFC stack. This JP8 fuel processor has operated stably for nearly 1,000 hours. The overall system is designed to capture and recycle water so that it can operate without an external water supply.

The latest generation SOFC stack was supplied by Versa Power Systems (VPS), a leading developer of planar solid oxide fuel cell stacks and systems. The twenty-one cell VPS stack produced nearly 800 watts of power with an impressive power level of 315 mW/cm². The next generation demonstration system will use advanced SOFC stacks to achieve the 3 to 10 kW power goal – suitable to meet the military's Mobile Electric Power (MEP) generation requirements while minimizing noise. The VPS SOFC stack development leverages the U.S. Department of Energy's Solid State Energy Conversion Alliance (DOE-SECA) program.

GTI is the leading research, development, and training organization serving the natural gas industry and energy markets. For more than 60 years, GTI has been meeting the nation's energy and environmental challenges by developing technology-based solutions for consumers, industry and government.

ERDC is the integrated Army Corps of Engineers' research and development organization. The center consists of seven laboratories, which include CERL. CERL conducts research and development in infrastructure and environmental sustainment. This research results in new technologies that help military installations provide and maintain quality training lands and facilities for Soldiers and their families. Many of these products also find use in the private sector. CERL represents a unique asset to the nation for research in civil engineering and environmental quality. Website: www.cecer.army.mil