Calnetix Unveils Breakthrough Technology for Converting Waste Heat into Electric Power

*Hydrocurrent™ System Produces Up to 125 kW of Electric Power from Thermal Energy in Engine Jacket Water*

Cerritos, Calif. – Sept. 8, 2014 – Calnetix Technologies today announced the introduction of a revolutionary new system that produces up to 125 kW of power for the ship’s electric load from heat recovered out of the engine’s jacket water.

The Hydrocurrent™ system was developed by Calnetix in conjunction with Mitsubishi Heavy Industries Marine Machinery and Engine Company (MHI-MME) and is being introduced to the worldwide maritime industry at SMM this week.

“Hydrocurrent™ pays for itself in a very short time by reducing the load on the ship’s bunker-fueled generators,” said Vatche Artinian, Calnetix chairman and CEO. “This can translate into fuel savings of up to 200 tons per year.”

Calnetix’s new waste-heat recovery technology uses an Organic Rankine Cycle (ORC) heat recovery process with Calnetix’s patented Thermapower™ and Carefree™ Integrated Power Module (IPM), which efficiently converts thermal energy into mechanical power. The Calnetix system is unique in that it can pull usable heat from a source with temperatures as low as 80°C (176°F) unlike other heat recovery systems that require much higher temperatures. The Hydrocurrent™ system converts excess waste heat into electric power without affecting engine performance, while still leaving sufficient heat in the jacket water for the fresh water maker.

The Hydrocurrent™ ORC module is a closed-cycle evaporator-condenser phase-change loop, using an organic fluid that has a very low boiling point. The fluid is pumped through an evaporator that pulls heat from the engine’s jacket water. The superheated vapor is expanded across the Carefree™ module, producing electric power, which is connected to the ship’s grid. The warm vapor then flows into a seawater-cooled condenser where it turns back into liquid form.

The Carefree™ IPM consists of a high-speed turbine expander and high-efficiency permanent-magnet generator in a single hermetically sealed housing. The friction-free magnetic bearings require no lubrication or maintenance.

The Hydrocurrent™ system has a small footprint and can be retrofitted easily in existing ships without making any major modifications to the engines. It is designed specifically for the shipboard environment...
and requires very little maintenance. Operator assistance is minimal; the system turns on and off automatically based on the heat source temperature.

The Hydrocurrent™ system is designed and built to ClassNK and Lloyd’s Register guidelines.

Calnetix has been working closely with MHI-MME since 2005 to develop technologies to improve ships’ energy efficiency without impacting vessel operation or performance through highly efficient and cost-effective pressure and heat recovery systems. Existing MHI-MME products with integrated Calnetix technologies include the MET Hybrid Turbocharger and the Electric Assist MET Turbocharger.

Calnetix will be adapting the Hydrocurrent™ technology for marine engine exhaust and engine scavenge air heat recovery.

“The core technologies comprising the Hydrocurrent™ and Thermapower™ ORC modules have been used for heat recovery in various applications in the United States, Canada, Europe, the Middle East and Asia since 2009 under Calnetix and our distributors and licensees, including GE and Daiichi Jitsugyo,” said Artinian. “Together with our partners, we have deployed over 35 MW of capacity in land-based installations.”

Calnetix is showing the Hydrocurrent™ product in Hall B7, Stand 316, within the USA/Canada Pavilion at SMM 2014.

About Calnetix Technologies
Calnetix Technologies, LLC (‘Calnetix”), headquartered in Cerritos, Calif., is focused on Innovation That Drives Industries™. The company specializes in high-performance, high-speed motor generators and best-in-class advanced magnetic bearings and control systems. Calnetix’s patented, underlying technologies, which have been in use since the company’s inception in 1998, have made Calnetix a world leader in the design and production of high-speed machines. The company’s overall technology portfolio and system integration capabilities have led to development and production contracts with industry leaders and the start of many successful subsidiaries that focus on unique niche markets. For more information, please visit www.calnetix.com.