



Smart Manufacturing Coalition-led Project Wins DOE Clean Energy Manufacturing Contract

\$10 Million Project to Launch Development of the Nation's First Open Smart Manufacturing Technology Platform for Collaborative Networked Information Industrial Applications

Washington DC - March 26, 2013 - The Smart Manufacturing Leadership Coalition (SMLC) today announced that it won a 2013 Clean Energy Manufacturing contract to start developing the nation's first open smart manufacturing technology platform for collaborative industrial networked information applications. The innovative project, led by the SMLC, will receive \$7.8 million in funding from the U.S. Dept. of Energy Office of Energy Efficiency & Renewable Energy's Advanced Manufacturing Program. SMLC arose out of a 2008 NSF grant awarded to CACHE Corporation with co-PIs Jim Davis and Tom Edgar.

“Together, we intend to transform industrial productivity and energize a new era of innovation by empowering manufacturers with real-time, plant-wide workflow intelligence needed to deliver higher levels of game-changing competitiveness,” said Dean Bartles, SMLC Chairman and SVP, General Dynamics. “Smart Manufacturing infrastructures and approaches will also let operators make real-time use of ‘big data’ flows from fully-instrumented plants to improve safety, environmental impact and energy, water and materials use.

The overall objectives of the initial SMLC project are to design and demonstrate this common platform that enables data modeling and simulation technologies to actively manage energy use in conjunction with plant production systems. The platform will show how real-time management of energy use as a key driver in business decisions can be applied across many small, medium and large U.S. manufacturing companies.

“For the past two decades, most U.S. manufacturers have managed energy efficiency in their factories and plants passively instead of actively as part of their production systems,” said R. Neal Elliott, director of Research at the American Council for an Energy-Efficient Economy and a coalition board member. His research estimates that “We can reduce U.S. manufacturing energy intensity by more than half in the next 20 years as we begin to integrate smart technologies that actively manage energy use across entire manufacturing systems, plants and ultimately supply chains.”

The SMLC's Platform development approach uses industrial test beds with actual manufacturing data and applications to ensure it is driven by industry needs. The first two test beds funded by the DOE Clean Energy Manufacturing contract will be at a General Dynamics Army Munitions plant to optimize an energy intensive heat treating and machining operation and at a Praxair Hydrogen Processing plant to optimize steam methane reforming furnaces. The test bed project

technologies could demonstrate how to make U.S. manufacturers more competitive by reducing annual generation of CO2 emissions by 69 million tons, and waste heat by 1.3 quads, or approximately 1.3 percent of total U.S. energy use.

Given the energy application focus for the Smart Manufacturing platform, the Principal Investigator is Professor Thomas Edgar, Director of the University of Texas at Austin Energy Institute and Professor of Chemical Engineering. “By combining high fidelity modeling and novel sensors, we can perform real-time control and optimization of process equipment to achieve significant reductions in energy consumption,” according to Dr. Edgar.

The project is a significant collaborative effort among Emerson Process Management, Honeywell Automation and Control Solutions, Invensys and Rockwell Automation to ensure the Smart Manufacturing Platform is compatible with multiple process control software systems and energy applications “Apps.” The American Institute of Chemical Engineers and the National Center for Manufacturing Sciences will develop standard metrics for energy productivity “Apps” and promote platform use to small, medium and large manufacturers. The industry-driven platform architecture and operating design will be developed by UCLA’s Institute for Digital Research and Education (IDRE) and Nimbus Services, a new U.S.-based business to business computational services company for manufacturing.

"21st Century Smart Manufacturing is manufacturing in which all needed information is available when it is needed, where it is needed and in the form it is most useful" said Jim Davis, UCLA vice provost / CTO. "The SMLC encompasses the essential collaboration for bringing the massive potential of today’s digital information to America’s plants and factories as the speed of business is accelerating. There is an unprecedented convergence in the ability to work with big data, to simulate, model and predict with game changing fidelity and to access previously unimaginable information and markets.”

"Ideally, progressive business leaders will soon view their plants and factories as innovation hubs and profit centers to be invested in rather than just cost centers to be cut with such little strategic value that they sometimes have been outsourced overseas,” said Denise Swink, CEO of SMLC, Inc. “We expect the Smart Manufacturing Platform will unleash American ingenuity and engineering prowess in ways that are as unexpected as how the IT revolution has changed every other aspect of our lives.”

Following is a brief description of each of the organizations involved in the initial Project:

Smart Manufacturing Leadership Coalition <http://www.smartmanufacturingcoalition.org/>
The SMLC, a non-profit organization established in Washington D.C. in 2012, is committed to overcome barriers to the development and deployment of Smart Manufacturing (SM) Systems through an implementation agenda for building a scaled, shared infrastructure called the Smart Manufacturing Platform (SM Platform). SMLC activities are built around industry-driven development, application and scaling of a shared infrastructure that will achieve transformational economic-wide impact, manufacturing innovation and global competitiveness. SMLC supports the manufacturing industry through pursuing a comprehensive technology that no one company can undertake. Without a modern industrial infrastructure, adoption of SM Systems is not economically viable. Process control and automation systems implemented in piecemeal fashion

will continue to limit innovation and capability. SMLC will build the business, interoperability and technology models, demonstrations, infrastructure, and project teams across multiple industry segments.

UT-Austin The Departments of Chemical Engineering and Mechanical Engineering are top ten departments with strong interactions with industry. Both have nationally recognized expertise in dynamics and controls, instrumentation and sensors, metals processing, and fluid flow and heat transfer modeling. Top U.S. graduate students are recruited by both departments.

UCLA The Institute for Digital Research and Education (IDRE) advances the existing body of computing knowledge and expertise, and is involved with many world class research groups involved in scientific computing, data analysis, energy management, sensor networks, dynamics, and control technologies. IDRE in conjunction with the Offices of Information Technology and Research designs and operates UCLA's high performance research cyber infrastructure facilities, and supports software application development for a wide range of research and development interests. The Department of Chemical and Bio-molecular Engineering is a top department with nationally recognized expertise in systems, dynamics, modeling, and control, and strong interactions with industry.

General Dynamics is a market leader in business aviation; land and expeditionary combat systems, armaments and munitions; shipbuilding and marine systems; and mission-critical information systems and technology.

Praxair is the largest industrial gases company in North and South America, and one of the largest worldwide, with 2010 sales of \$10 billion. The Company produces, sells and distributes atmospheric and process gases, and high-performance surface coatings. Praxair products, services and technologies bring productivity and environmental benefits to a wide variety of industries, including aerospace, chemicals, food and beverage, electronics, energy, healthcare, manufacturing, metals and others.

Emerson Process Management, an Emerson business, is a leader in helping businesses automate their production, processing and distribution in the chemical, oil and gas, refining, pulp and paper, power, water and wastewater treatment, metals and mining, food and beverage, life sciences, and other industries. The Company combines superior products and technology with industry-specific engineering, consulting, project management and maintenance services.

Honeywell Automation and Control Solutions products, services, and technologies are at work in 150 million homes and five million buildings worldwide as well as numerous planes, trains, and automobiles. The Company's systems monitor and control processes to improve the productivity of complex industrial plants, and make it possible to miniaturize sophisticated, implantable medical devices. The common denominator across the entire product portfolio is expertise in sensing and control, which is used to capture more and better data and applied to make devices, systems, and processes smarter, more capable, and more valuable.

Invensys develops and applies advanced technologies that enable the world's manufacturing and energy generating facilities, mainline and mass transit rail networks, and appliances to operate

safely and in an energy efficient manner. The Company works with nearly all of the major petroleum and chemical companies.

Rockwell Automation is the world's largest company dedicated to industrial automation and information. From stand-alone, industrial components to enterprise-wide integrated systems, its systems have been proven across a wide range of industries and in some of the most demanding manufacturing environments. The Company employs about 22,000 people and has global capabilities extending across 80 countries, including a Partner Network of more than 1,200 regional and global specialists in distribution, system integration, and product referencing.

Nimbis Services acts as a nationwide brokerage and clearinghouse for a broad spectrum of Digital Analysis Computing (DAC) Services. Nimbis pre-negotiates volume priced contracts with DAC vendors to provide easy, affordable, reliable "pay-as-you-go" access to compute cycles, third-party software, and expertise.

American Institute of Chemical Engineers (AIChE) is the world's leading organization for chemical engineering professionals, with over 40,000 members from over 90 countries. AIChE has the breadth of resources and expertise needed for core process industries or emerging areas, such as nano-biotechnology.

National Center for Manufacturing Science (NCMS) is a nonprofit, member-based consortium. The organization's objective is to drive the global competitiveness of North American Manufacturers through collaboration, innovation, and advanced technologies.