

## Division 8000 News Notes for July 2009

### **A High-Load Milestone Achieved with Homogeneous-Charge Compression-Ignition (HCCI) Engine Operation:**

A major focus of HCCI research has been on extending its load range capability to typical high-load engine conditions without introducing engine knock or NOx pollutant emissions. Using a combination of boosted intake air (simulating turbo-charging), Exhaust Gas Recirculation (EGR), and combustion timing retard, a load of 16 bar Indicated Mean Effective Pressure (IMEP) was achieved using conventional 87-octane gasoline with an indicated efficiency of 47%, no engine knock, and ultra-low NOx emission (0.1 g/kg-fuel). The results demonstrate that boosted HCCI has strong potential for achieving power output and thermal efficiency comparable with those of today's high-efficiency turbo-charged diesel engines, but with low pollutant emissions and an overall lower cost engine architecture. *Submitted by Dennis Siebers, 8362, 925-294-2078*

### **Sandia Hosts Homeland Security Meeting:**

On June 4, 2009, Sandia was honored to host the first meeting in the new administration of the Homeland Security Advisory Council (HSAC) and the Southwest Border Task Force. The HSAC provides advice and recommendations to the secretary of homeland security, and is composed of leaders from state and local government, first responder communities, the private sector, and academia. We showcased Sandia's borders-related work via tours of the Robotics Vehicle Range (RVR) and the International Programs Building (IPB). The tours provided information on Sandia's physical security programs and technologies, international border security and radiation detection systems, robotics, unattended ground sensors, and modeling and simulation. *Submitted by Susanna Gordon, 8101, 925-294-3634*

### **Charles Mueller (8362) and colleagues from Caterpillar receive the prestigious Harry L. Horning:**

Memorial Award given annually by the Society of Automotive Engineers: Charles Mueller of Sandia and Glen Martin, David Milam, Michael Radovanovic and Christopher Gehrke of Caterpillar received the Society of Automotive Engineers (SAE) prestigious Harry L. Horning Memorial Award for their paper "Early Direct-Injection, Low-Temperature Combustion of Diesel Fuel in an Optical Engine Utilizing a 15-Hole, Dual-Row, Narrow-Included-Angle Nozzle" (SAE Technical Paper 2008-01-2400). The Horning award is presented each year to recognize the best technical contribution to the field of engine and fuel utilization R&D. The paper shows mechanisms by which liquid-fuel films can be formed on walls within the engine combustion chamber, and how the subsequent presence or lack of ignition of the films affects combustion and engine-out emissions. The understanding is critical for developing advanced, low-temperature combustion strategies that will enable a new generation of clean, high-efficiency engines. The award will be presented at the SAE Fall 2009 Powertrains, Fuels and Lubricants Meeting in San Antonio in November. This is the seventh time that researchers at the CRF have received this award, which is more than any other company or institution world-wide since the inception of the CRF. *Submitted by Dennis Siebers, 8362, 925-294-2078*

### **Air Handler Replacement in CA Network Center:**

Two air handlers that were first installed in 1978 have been replaced with new, efficient air handlers. This is a significant step in our continual efforts to keep the network infrastructure at peak performance while lowering costs. The partnership with Facilities was very smooth.

*Submitted by Brian A. Maxwell, 8949, 925-294-2371*

**W80-1 JTA8 FPU Reached:**

The W80-1 JTA8 effectively reached its FPU on Tuesday July 21st by selling the unit to NNSA at the "warhead" level, nearly two weeks ahead of schedule. JTA8 provides enhanced capabilities and replaces obsolete technologies used in W80-1 JTA1. The JTA8 program is under budget and the FPU date of July 31st, 2009 has never slipped since the inception of the program in January 2007. While Sandia led the program, significant contributions came from LLNL, Honeywell FM&T, and Pantex. *Submitted by Howard Royer, 8238, 925-294-2635 and Jim Berg, 8238, 925-294-3580*

**Sandia's Tiny Address:**

Sandia has a new SRN-based version of a URL shortening program (like TinyURL.com or bit.ly) at <http://tiny.sandia.gov>. It can be used to provide a short alias URL in place of a longer one, which is particularly useful for email and microblogging. The original, long URL can be either internal (SRN) or external and of type http or https. The resulting tiny address will be on the SRN so should be shared only internally. *Submitted by Tracy Walker, 8947, 925-294-3550*