

Press Release



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For Immediate Release

Contact: John Wray
E-mail: jwray@brtrc.com
248-310-7231
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U.S. Army's Fuel Efficient Vehicle Program Rolling Forward with Support from Industry and Academic Technology Partners

DETROIT ARSENAL, WARREN, MI – Dwindling resources. Escalating fuel prices. Growing national security concerns. The Greenhouse Effect. What do these have in common? They all have the attention of the Army.

As the owner of the world's largest fleet of ground vehicles, the U.S. Army has a significant stake in lowering its overall fuel consumption while maintaining maneuverability and occupant protection. As a good steward of both the environment and government resources, the Army aggressively seeks technology solutions to these stated concerns.

Some of the answers to questions raised are being found in the work conducted by the U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC) as part of a collaborative program that harnesses government, industry and academic solutions to provide next-generation, fuel-efficient technologies.

TARDEC's Fuel Efficient ground vehicle Demonstrator (FED) program was established by the Office of the Secretary of Defense to demonstrate, through a systems engineering approach, decreased fuel consumption while minimizing the impact on the performance or capability of a tactical vehicle by integrating fuel efficient technologies and advanced lightweight materials into innovative designs.

To prove out myriad vehicle technologies that save fuel while keeping Soldiers safe, the program taps into the expertise and experience of TARDEC scientists and engineers, private contractors and even design students from the College for Creative Studies (CCS) in Detroit.

"The FED program is designed to leverage automotive expertise and technology that exists in the commercial market space in motor sports to help the Nation and the warfighter," explained TARDEC Executive Director for Product Development Thom Mathes. "A critical part of our responsibility as the Nation's leading ground vehicle

– more –

Press Release



– 2 –

systems integrator is to leverage the novel and innovative design concepts, technology expertise and research that exists outside our organization on behalf of the military.”

Mathes continued, “At the same time, we are building crucial partnerships with academic and industry organizations and focusing on interdependence that allows us to maintain a high level of systems engineering success.”

Two teams, two approaches

Two teams have been developing concepts under the FED program. Contracts were issued last year to **Select Engineering Services, Inc.**, (SES) and **World Technical Services, Inc.** (WTSI). Subsequently, SES brought Ricardo, Inc., onto the team to provide automotive and racing expertise.

The SES/Ricardo team recently cleared a critical design review with the Department of Defense and TARDEC, and will begin building a prototype vehicle this month. WTSI, working with CCS students, will undergo a critical design review of its vehicle in the fall.

“TARDEC’s FED Program has multiple objectives,” Mathes pointed out. “These include identifying new fuel-efficient vehicle technologies, maintaining tactical-vehicle capability while increasing fuel efficiency, establishing a training approach for the next generation of government scientists and engineers, and pursuing public-private collaboration that leverages the best systems-engineering processes.”

The FED program instituted a dual-track approach to vehicle development and fabrication. The Ricardo team is following a more-traditional product development path, while WTSI has applied a “monster garage” process to the program. The differences are notable. Ricardo has led development of its vehicle program and, with the participation of TARDEC-embedded engineers, has produced concepts, designs and data to support a set of military vehicle program specifications. The “monster garage” method has relied upon a TARDEC-led government-industry team of subject matter experts who have been sifting through the most innovative and compelling fuel-efficient technologies to determine which should be incorporated into the next generation of Army vehicles.

Teams apply systems engineering tools to validate vehicle technologies

Both approaches incorporate cutting-edge modeling and simulation capabilities allowing teams to predict vehicle performance and optimize clean-sheet, system-level engineering and design solutions. The FED program also provided teams with critical support, including Lean Six Sigma tools, Structured Innovation Training and Theory of Problem Solving historical benchmarking resources.

– more –

Press Release



– 3 –

The FED program established a rigorous validation process to better ensure that the proposed vehicle designs and technology meet the needs of stakeholders and customers.

Six vehicle architectures have been considered by the teams. Propulsion systems being investigated include dual internal combustion engine technology, series hybrid and parallel hybrid architectures, and conventional, lightweight modern diesel engines with integrated starter generators.

Transmission technologies such as 32-speed binary logic transmissions, and suspension concepts that use adjustable height suspensions, have also been incorporated into the concept designs. Other technologies like low friction coatings, advanced synthetic lubricants, Lithium-ion batteries, advanced body materials, ceramic brake rotors, aluminum wiring, regenerative braking, central tire inflation systems, driver feedback, v-shaped hulls, isotropic finishes and remotely operated weapon stations are also being investigated in order to lower fuel consumption of the concepts being developed.

The STS/Ricardo FED is scheduled for completion in the first quarter of 2011 and the WTSI FED in the second quarter of 2011. TARDEC will begin testing the demonstrators at Aberdeen Proving Grounds, MD, in the second quarter of 2011.

ABOUT TARDEC

Headquartered at the Detroit Arsenal in Warren, MI, TARDEC is the Nation's laboratory for advanced military automotive technology and serves as the Ground Systems Integrator for all DOD manned and unmanned ground vehicle systems. With roots dating back to the World War II era, TARDEC is a full life-cycle, systems engineering support provider-of-first-choice for all DOD ground combat and combat support weapons, equipment and vehicle systems. TARDEC develops and integrates the right technology solutions to improve Current Force effectiveness and provides superior capabilities for Future Force integration. TARDEC's technical, scientific and engineering staff lead cutting-edge research and development in Ground Systems Survivability; Power and Mobility; Intelligent Ground Systems; Force Projection; and Vehicle Electronics and Architecture.

TARDEC is a major research, development and engineering center for the U.S. Army Research, Development and Engineering Command (RDECOM) and partner in the TACOM Life Cycle Management Command.

For more information about TARDEC, visit us at www.tardec.army.mil. You can also follow us on Twitter at http://twitter.com/TARDEC_PAO.

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