

# Advanced Hybrid Electric HMMWV

## Project Objective

Incorporate numerous advanced technologies and components into the existing hybrid electric HMMWV developed under DARPA funding to improve and expand various capabilities such as mobility, silent watch, survivability, active suspension, and advanced electronic concepts. These advanced technologies and components are being investigated to address the specific needs of the future ground combat and support vehicles, known as the Future Combat System (FCS) vehicles.



## project overview

This project will utilize the original Hybrid HMMWV prototype developed earlier under DARPA funding as a baseline platform to which various technological advances will be incorporated to evaluate and test. As these technologies are demonstrated and their maturity established, selected items will be migrated from this effort to the production version of the HE HMMWV now under development by the U.S. Army. In so doing, the production HE HMMWV will be maintained at the highest possible state of the art and product maturity.

## Team Members

- PEI Electronics, Inc.
- Tank-Automotive and Armaments Command (TACOM)
- SAFT America, Inc.
- Unique Mobility
- University of Texas – Center for Electromechanics
- Center for Transportation and the Environment (CTE)



## Project Description

The project will address four (4) specific major technological advances; These are:

1. Advanced Lithium Ion batteries to provide significantly increased storage of energy and peak power. This will provide improvements for support of current and future weapon systems and mission capabilities of the vehicle itself relative to the hybrid power train and its use as a mobile power system.
2. Active suspension for improved off road mobility and survivability and to achieve a comparable level of off road mobility to that of the Abrams tank and Bradley Fighting vehicles.
3. Improved generating capability for vehicle propulsion and auxiliary power through advanced motor generator systems. This includes alternate methods of power generators such as turbines and Fuel Cells.
4. Advanced, higher torque, traction motors for enhanced gradeability and overall vehicle performance in a production intent packaging concept for independent wheel drives.

## Next Steps

The prototype hybrid-electric HMMWV will be upgraded to the current version power train now being developed for the U.S. Army under a TACOM contract to bring this early vehicle into a current configuration. At the same time, a Lithium Ion Battery pack has been obtained to initiate characterization tests and fabrication of a companion battery tray and battery management system to install this new technology into the vehicle.

Additional contracts will be issued for development of advanced Silicon Carbide power devices to start efforts at reducing the size and weight of power control electronic systems and their associated cooling systems. Next year, a contract will be let for the development of a traction motor that will fit within the existing HMMWV structure in the place of the differentials that will improve vehicle performance, improve produceability and reduce weight and cost of the production intent vehicle. Additional contracts for other technologies will follow as funding allows.

