

U.S. Army Tank Automotive Research, Development & Engineering Center

TARDEC



TECHNOLOGY BASE INITIATIVES



Dr. Richard E. McClelland

October 2003



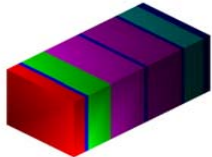
FCS Block I Technologies



Survivability ATD

Ballistic Protection

- Medium Cannon
- RPG
- APS Residuals



Integrated Defense System Active Protection System

- CE Anti-Tank Protection on-the-move



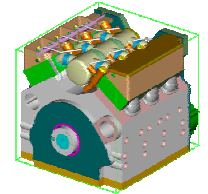
Signature Management

- Visual
- IR
- Radar



Combat Hybrid Power System

- Power Architecture
- Active Suspension
- Hybrid Electric Drive
- Band Track



FCS Engine

- Compact engine for space constrained FCS
- Diesel & Turbine
- Demo'd performance/durability

Water Purification Technology

- Embedded Water Production
- Soldier water devices



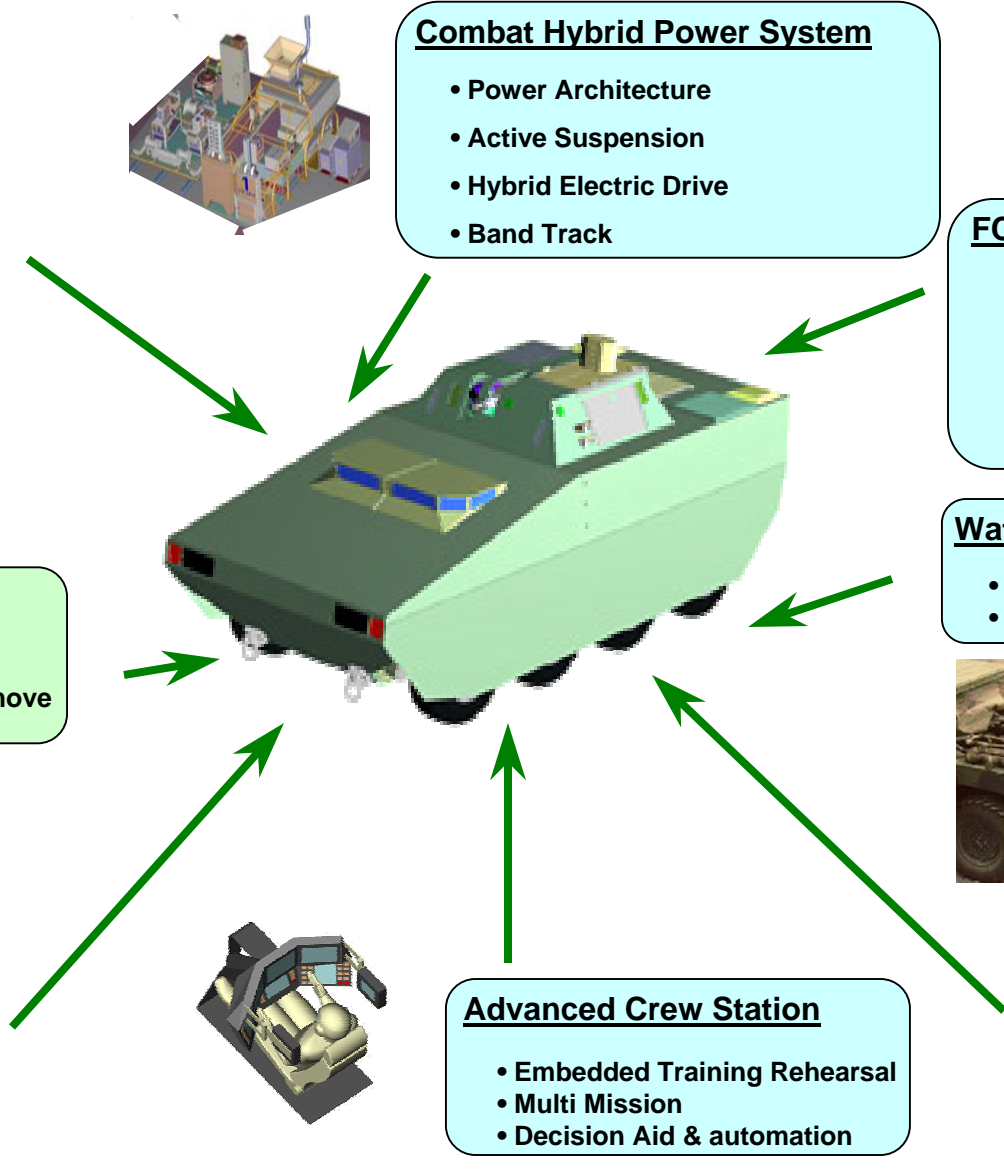
Advanced Crew Station

- Embedded Training Rehearsal
- Multi Mission
- Decision Aid & automation



Robotic Follower ATD

- Teleoperated control
- Road following
- Soldier-Robot interaction





FY 04 Contract Actions

Existing Contracts / 04 Actions

Survivability Technologies

• Close in Radial Coverage Sensors	\$4.95M	Chang Industries
• SIL Upgrades to Integ Survivability	\$839K	BAE Sytems
• Active Protection Development	\$500K	N/Grumman
• Active Protection Testing	\$1M	EMRTC
• Sensor Countermeasures	\$50K	BF Goodrich
• FCLAS Development	\$9M	Chang Industries
• Active Protection Modeling	\$750K	Gleason
• Active Protection Interceptor	\$7M	N/Grumman
• HARPS System Development	\$400K	BAH



FY 04 Contract Actions



Existing Contracts / 04 Actions

Survivability Technologies Continued...

- | | | |
|-------------------------------|--------|----------------|
| • Armor Material Property | \$400K | Univ of Hawaii |
| • Armor Model | \$50K | BAH |
| • Armor Materials Support | \$300K | Sandia |
| • Laser Eye Protection | \$300K | Boeing |
| • Adv Armor Dev – FCS | \$2M | SAIC |
| • Residual Penetrator Effects | \$800K | SWRI |
| • Armor Materials Research | \$100K | ARA |



FY 04 Contract Actions



Existing Contracts / 04 Actions

Vetronics Technologies

- | | | |
|-------------------------------|--------|--------------|
| • Flex Power Bus Hardware | \$175K | GDLS |
| • Virtual Simulated Integ Lab | \$20K | UofM |
| • Remote Imaging for UGVs | \$400K | Lock-Martin |
| • Human Perf Modeling | \$40K | Oakland U |
| • Diag / Prognostics UGVs | \$200K | Amer Systems |
| • AMPS | \$475K | UofM / DCS |

Propulsion Technologies

- | | | |
|---------------------------|---------|-------------------------------|
| • FCS Engine Alternatives | \$11.2M | Detroit Diesel /
Honeywell |
|---------------------------|---------|-------------------------------|



FY 04 Contract Actions



Existing Contracts / 04 Actions

Bridging Countermine Technologies

- Ltweight Mech Countermine \$455K KRC / Natl Soil Dynamics / Aberdeen
- Modular Composite Bridge \$2.5M Seeman
- Field Repair Comp Bridges \$375K Alphastar
- Innovative Wet Gap Crossing \$70K Proposals Recd
- Technologies for FCS
- Biodegradable Matting / Temp Roadways \$70K Proposals Recd



FY 04 Contract Actions



Existing Contracts / 04 Actions

Water Technologies

- | | | |
|---|---------|------------------------------|
| • Water from Exhaust | \$750K | LexCarb |
| • Hollow Fiber Fwd Osmosis | \$415K | Separation Systems |
| • Water from Air | \$4.5M | Messo / Honeywell / Hamilton |
| • Purification of Exhaust Condensate | \$500K | Biosource |
| • Dev Rapid Installed Fluid Transfer System | \$600K | SWRI |
| • Water Monitoring | \$2.65M | Wayne State |
| • NBC Water Treatment | \$1.2M | ACTI |



FY 04 Contract Actions



Existing Contracts / 04 Actions

Mobility Technologies

• Lion Battery Development	\$800K	SAIC
• Active Suspension	\$1.3M	SAIC
• FCS SIL Support	\$1.6M	SAIC
• SIL Reconfiguration	\$2.2M	SAIC
• SIL Operations	\$1.3M	SAIC
• LMTV / Suspension	\$360K	SAIC
• Active Damping Suspension	\$130k	Rod Millen
• Combat Vehicle Mobility	\$4.5M	CTC
• Fastening & Joining Res Inst	\$1.0M	Oakland U
• Internal Heat Management	\$1.0M	SAIC
• Super Lattice	\$350K	SAIC



FY 04 Congressional Adds



Approximately \$121M in projects

- University Based Automotive Research
- Automotive Research Center
- Advanced Electric Drive
- Soldier Mobility Program – M Gator Improvements
- Fuel Preperator
- Corrosion Resistant Coatings
- Rapid Small Trailer Corrosion
- Prototyping Technologies
- Unmanned Vehicle Control Technologies
- Advanced Energy and Manufacturing Technology
- Advanced Coatings Research
- Advanced Manufacture of Light Weight Materials
- Army Truck Diagnostic System
- Auragen Vehicle Integrated Primary Electrical Resource



FY 04 Congressional Adds Continued



- CALSTART Defense Advance Trans
- Combat Vehicle Mobility System
- Fuel Efficiency Technology
- Full Spectrum Active Protection Close-In Layered Shield (FCLAS)
- Future Tactical Truck (FTTS) Companion Trailer System
- Hydrogen PEM Ambient Pressure Fuel Cell Demo
- Hydrogen PEM Fuel Cell Heavy Duty
- Military Wheeled Vehicle Electronic Architecture
- Reduced Programmed Growth
- SmarTruck
- Soldier Mobility Program
- Hybrid HMMWV Technology Insertion Program
- Moldite
- Digital Humans and Virtual Reality
- Ballistic Missile Technology



FY04 Congressional Adds Continued



- Aluminum Lightweight Structures
- Advanced Army Modular Composite Bridge
- 21st Century Truck
- IMPACT
- Fuel Cell Technology
- Advanced Collaborative Technologies
- Fastening and Joining Technologies
- Tactical Vehicle Design Tools
- Advanced Thermal Management Controls
- Advanced Composite Materials
- Composite Body Parts – CAV Technology Transition
- Battery Charging Technology
- Smart Battery and Intelligent Generator Technology
- Electrochromatic Material Windows and Research
- High Power Density and Efficiency OPOC Engine and Elec Power Cell



FY04 Congressional Adds Continued



- Turbo Fuel Cell Engine
- Hydrogen Infrastructure
- Ultra High Performance Hybrid Structures and Armors
- Pacific Rim Corrosion Resistance Program
- Mobile Parts Hospital
- Center for Advanced Vehicular Systems
- Chemical Warfare Agent Detection Systems
- Ultra Reliability for Combat Systems
- Mechanically Assisted Spare Tire Center for HMMWVs
- Standardized Exchange of Product Data – N Step
- Rapid Optimization of Commercial Knowledge for FCS



FY04 Competitive Solicitations



FY 04 Broad Agency Announcement (BAA) *To be Announced Any Day.*

1. Investigate Effects of Low Level Aromatics in JP8 fuel (\$1M)
2. Fuel Cells as Ground Vehicle Auxiliary Power Units (\$1.5M)
3. Computer Generated 3D Holographic Display (\$1.1M)
4. In-Hub Motor Technology (\$2.1M)
5. Military Vehicle Batteries Reduction (\$3.5M)

Check the Warren Business Opportunities link at www.tacom.army.mil



FY04 Competitive Solicitations



Other **possible** Solicitations for release sometime in FY 04

From Mobility Technology Area

POC Dan Herrera
586.574.6411

- Traction Motor (\$450K)
- Continuous DC-DC Converter (\$1M)
- Hybrid Si.Sic (\$200K)

From Water Technology Area

POC Fred Balling
586.574.4100

- Design/Prototype Portable POL Quality Analysis (\$400K)
- Prototype POL Quality Sensor (\$250K)



FY04 Competitive Solicitations



Other **possible** Solicitations for release sometime in FY 04

From Survivability Technology Area

POC Steven Schehr
586.574.5780

- Survivability Close-in Concept (\$300K)
- Active Protection Radar Development (\$4M)
- FCS Integrated Survivability Platform (\$5M)

From Bridging and Countermining Technology Area

POC Jack Peterson
586.5745900

- Lightweight Mechanical Countermining (\$40K)
- Battlespace Gap Defeat Tech (\$500K)



Next Generation Tactical Wheeled Vehicles (Phase I) (FTTS)



- FY 03 BAA Topic #22 announced – 20 Dec 02
- Joint development of hybrid advanced technology tactical wheeled vehicles with a 3 to 20 ton payload.
-
- The vehicle demonstration platform(s) shall include technologies that will enable the Army to meet the deployment and sustainment goals of the FCS and FTTS (*MSV and UV variants*) programs.
- Core objectives will be a 30% reduction in fuel consumption; combat vehicle mobility; internal C130 & external CH-47 air transportation without preparation; intelligent load handling system (load cargo & containers directly onto C-130 off load partial loads from flat racks); reduced logistics footprint; pit stop maintenance concept; improved vehicle capability; crew ballistic and mine protection capability; and a 1-to-1 ratio of vehicle weight to cargo capacity.
-
- The sharing of data or current Models will be required for the Modeling and Simulation effort that will be utilized throughout the execution of this project.
- GPV, Oshkosh, S&S, UDLP Contracts Awarded : 25 Sept 03 – 20 Oct 03
- Final Demonstration Option – 30 Jul 04
 - Hybrid Propulsion, C-130 Deployability, ILHS, Pit-stop Maintenance
- Full and Open Competition for FTTS ACTD (Phase II) to Follow



Future Tactical Truck Systems (FTTS) Advanced Concepts Technology Demonstrator (ACTD)



- FTTS is the next generation of tactical vehicles and will support the Future Force
- Comprised of two classes: FTTS-MSV (Maneuver Sustainment Vehicle) 11T payload, and the FTTS-UV (Utility Vehicle) 2 ½ T payload
- FTTS candidate technologies fall into the following primary categories:
 - Fuel Reduction / Increase Range
 - Transportability – C130 Roll On Roll Off
 - Cargo Handling / Smart Distribution Systems
 - Mobility – Adjustable Suspension Height
 - Survivability / Self Defense Systems
 - Command, Control, Communications, Computer, Intelligence, Surveillance, and Reconnaissance (C4ISR)
 - Water Generation
- Approximate \$42M effort.
- Announcement to be posted in near future on the Warren Business Opportunities Link at www.tacom.army.mil or <http://contracting.tacom.army.mil>



Small Business Innovative Research (SBIR)



FY03/04

- 43 Phase I Awards Totaling \$ \$ 2,931,259
- 31 Phase II Awards Totaling \$22,591,230
with \$1,337,689 in Options



SBIR FY05 Cycle Competitive Solicitation



Pre-Solicitation - May 04

Open Solicitation - July 04

TARDEC SBIR Manager Mr. Alex Sandel; 586.574.7545