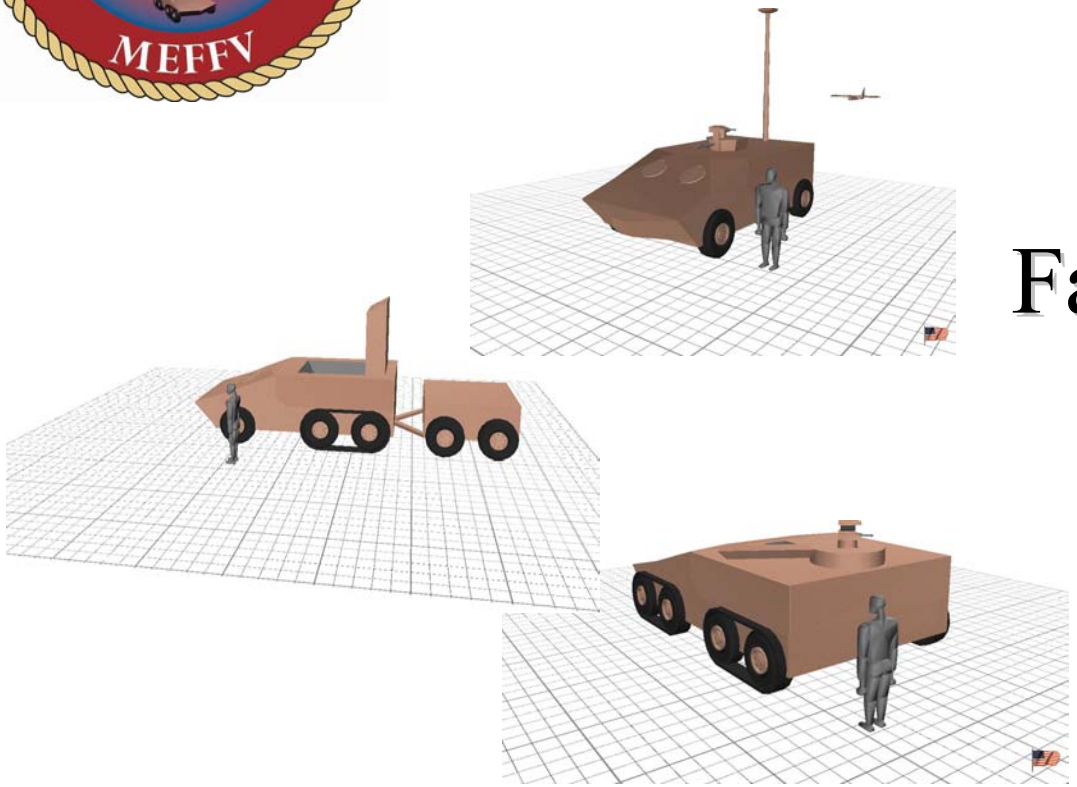
MAGTF Expeditionary Family of Fighting Vehicles (MEFFV)



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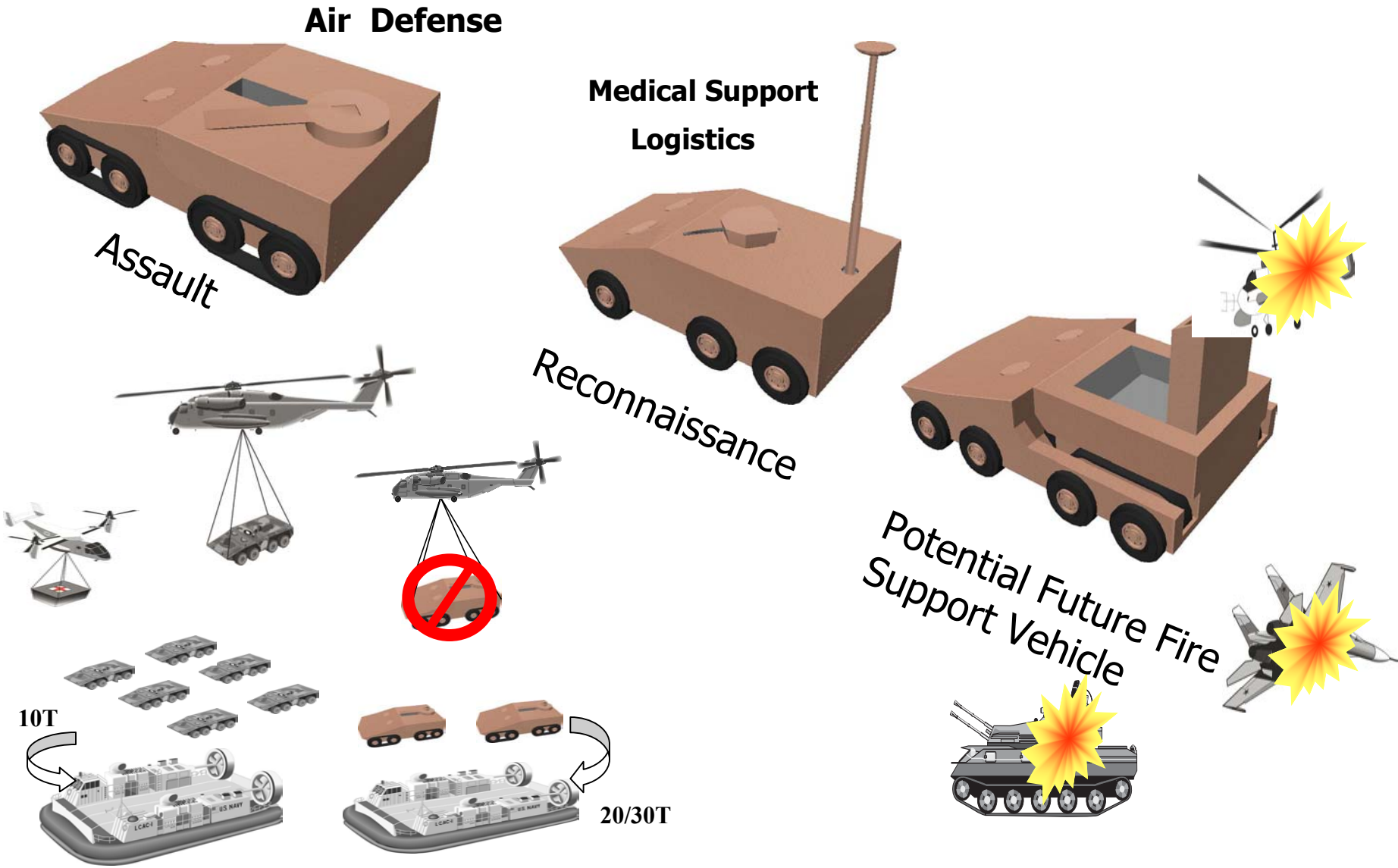
Project Description

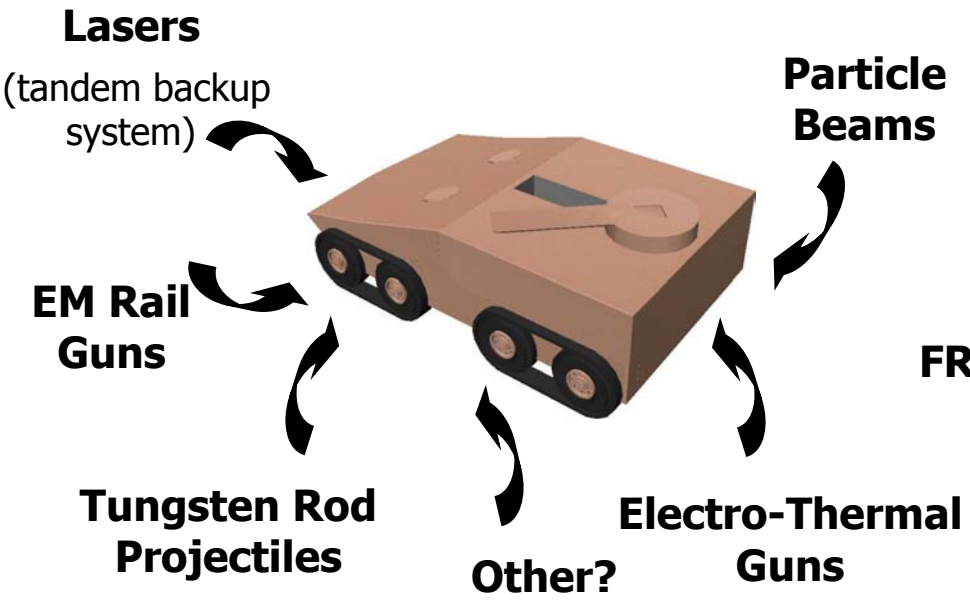
MEFFV addresses the shortfalls of the M1A1 Common Main Battle Tank (MBT) and the Light Armored Vehicle (LAV) Family of Vehicles (FOV) that will render them unsuitable on the future battlefield. It is a leap ahead technology approach to combat vehicle development that will replace the LAV and the M1A1, which reach the end of their service lives starting in 2015 and 2020 respectively. MEFFV is not intended to be a one for one replacement; it is expected to be a system of systems that will provide the capabilities necessary to win on future battlefields.

Variant Approach

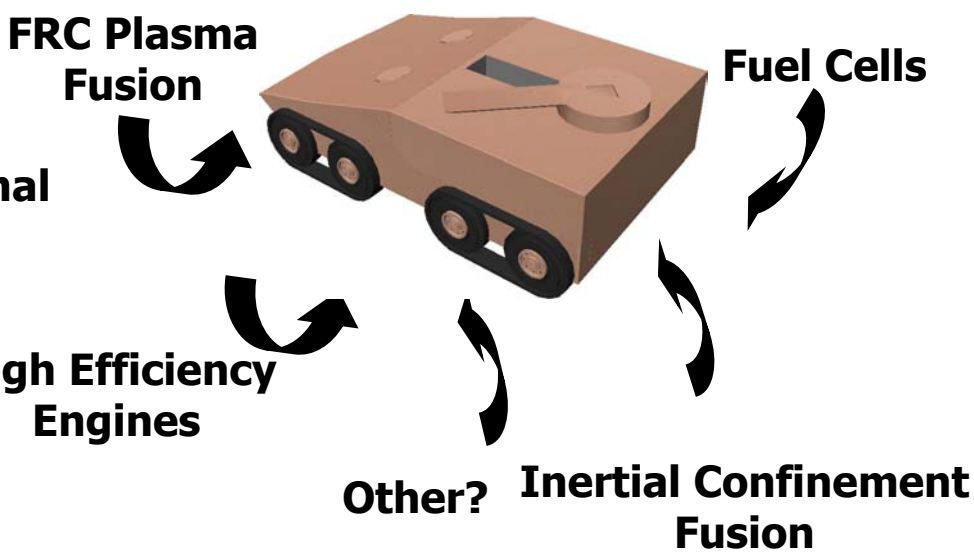


Technology Thrusts

Advanced/Directed Energy Weapons



Advanced Propulsion



Technology Thrusts

Composite Materials/Alloys

Titanium Alloys

Synthesized Metals

Frequency Selective Surfaces/Compounds

Other?

Ballistic Integrity
Low end of lethality scale <105 mm

- embedded sensors
- thermally reductive

Sensor Data Fusion

VIDS Microprocessor Interface

Vehicle Smart Center

V-tronics Suite

Multi-spectral Integrated Sensor

Embedded Diagnostics/ Prognostics

Other?

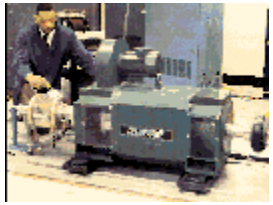
Core Architecture
- ***1883 Data Bus or greater***
- ***Unlimited growth/expansion***
- ***Multi-functional/3D P3I core architecture***

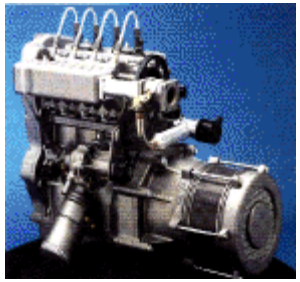
MEFFV Technology Areas

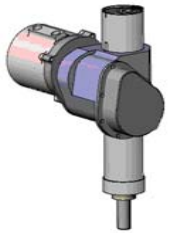
MEFFV Advanced Propulsion/ Tactical Mobility Technologies

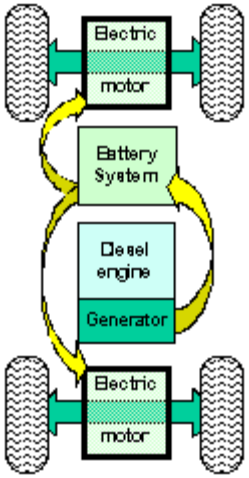
Objective:

Investigate advanced electric drive and innovative suspension technologies to enable the MEFFV to carry requisite payload and mission equipment while reducing fuel consumption, support requirements, and personnel. These technologies must also facilitate a reduction in vehicle emissions, simplify maintenance, reduce noise and thermal signatures.









Tasks	FY04 ($.629M)				FY05 ($.800M)			
1. Develop propulsion road-map to determine future power requirements.	.075	.050	.025	.025	.075	.050	.050	.050
2. Develop mission scenarios & profiles ie wheel v. track.	.075	.050	.025	. 025	.075	.050	.050	.050
3. Assess design architecture for component commonality.	.075	.050	.025	.025	.075	.050	.050	.050
4. Monitor and leverage Electric Warship/Combat Vehicle FNC.	.015	.010	.010	.010	.015	.015	.010	.010
5. Conduct Limited Technical Assessments of existing electric vehicle platforms.		.025	.020	.014	.025	.020	.015	.015

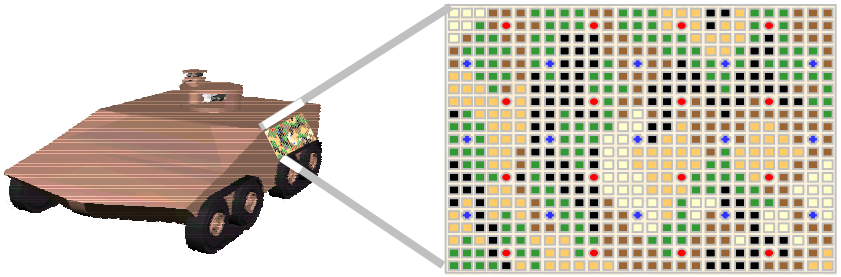
Payoffs

- Off road and high sustained road speed above the threat and supported forces.
- Double (diesel and/or turbine) state of the art engine technology power density.
- 50% weight reduction of steel track, reduced acoustic signature, IR signature and reduced maintenance.
- Optimized suspension for all load conditions and integrate functions which will save weight, space, and costs.
- Develop lightweight power sources i.e., batteries, fuel cells, etc.
- Lightweight high power/high energy storage architecture will reduce weight and logistics (resupply).
- Conduct early and frequent field experiments on relatively low-cost platforms that prove out rapid demonstrations that foster transition.

Survivability (Passive)

Objective

Exploit materials science applications to support MEFFV.
Provide assessment of candidate vehicle armor & structures.



Execution Plan

MILESTONE/EVENT	FY 04 ($.350M)				FY 05 ($.600M)			
1. Conduct assessment of new technology base/appliqué armor materials versus threat munitions.	.045	.065	.075	.085	.085	.085	.065	.065
2. Investigate embedded sensor technology development & ballistic protection versus signature management initiatives.		.020	.020	.040	.060	.080	.085	.075

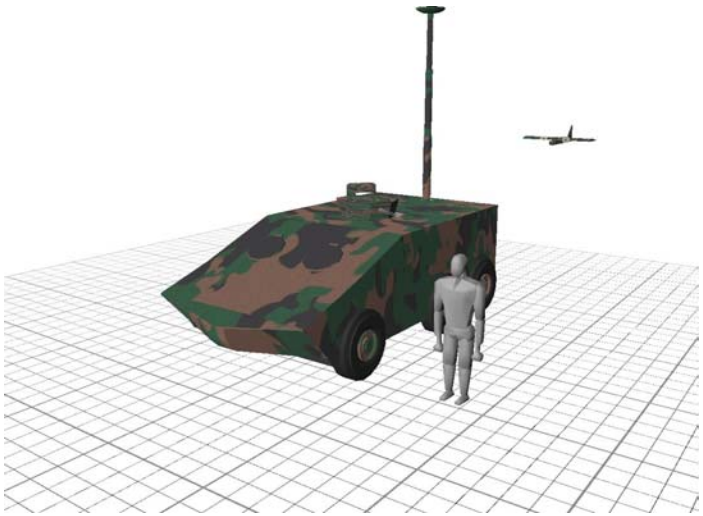
Payoffs

•Provide superior survivability at optimum vehicular weight, incorporating advanced base and/or appliqué armor.
• Provide ballistic protection, while incorporating emerging embedded sensor technologies and signature management initiatives.
• Reduce armor maintenance/repair requirements.

Survivability (Active)

Objective

Investigate active survivability capability needs and technical risks of emerging active protection technologies. Understand the future threat environment and identify active protection technologies for subsequent exploitation for MEFFV.



Execution Plan

MILESTONE/EVENT	FY 04 ($.200M)				FY 05 ($.250)			
1. Determine threat suite relevant to MEFFV mission profile.	.010	.025	.010					
2. Correlate technologies to MEFFV capability needs. (Develop Active Survivability POA&M)		.010	.015	.010				
3. Populate active survivability portion of Capability Architecture through Service & Joint games, experiments, M&S for Baseline #1.			.050	.070	.070	.040	.030	.010
4. Initiate long range Studies & Analysis Plan for active/passive integration.					.020	.025	.035	.020

Payoffs

- Provide real time classification, for maximum distance intercept, against broadest range of incoming threats.
- Defeat multiple munitions prior to vehicle impact, with emerging soft/hard kill technologies.
- Minimize residual effects base armor must defeat.

MEFFV Lethality

Objective:

- Provide lethality subsystem for the MEFFV variants commensurate with the threat and power budgets minimizing the logistics and safety considerations inherent in conventional weapons systems

Compact K-E Missile

Laser

Electro-Thermal Chemical Gun

Electro-Magnetic Rail Gun

Execution Plan

Tasks	FY 04 ($.3M)			FY 05 ($0.6M)			
1. Establish baseline capability performance needs and constraints.	.05	.025	.025	.025	.025	.05	.05
2. Assess lethality system opportunities to identify their salient characteristics.	.05	.025	.025	.025	.025	.05	.05
3. Determine the target set for MEFFV.	.05	.025	.025	.025	.025	.025	.05
4. Assess target acquisition systems and targeting methodologies.				.1	.025	.025	.025

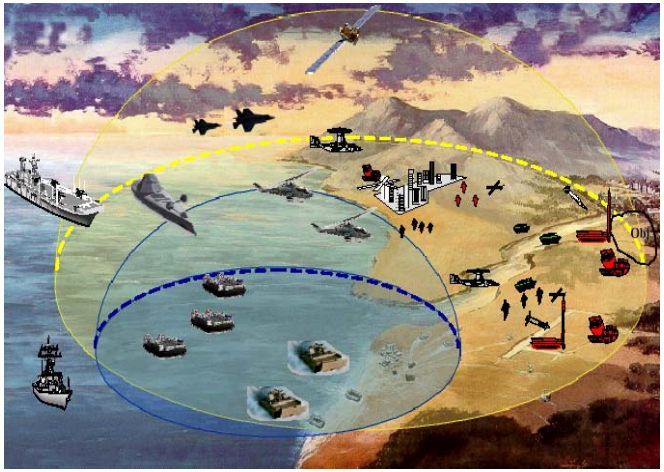
Payoffs

- **DE**: LOS, speed of light attack; no ammo resupply; simple and inexpensive training; potential for NL attack
- **EM**: No stored or resupplied propellant; large “stowed kill” ability; scalable overmatch
- **ETC**: Insensitive propellant; potential for softened recoil
- **Conventional**: Low risk proven technology; small caliber facilitator
- **Missiles**: mission specific lethality

C4ISR

Objective:

Map MEFFVC4I capability needs to Naval C4I plans to develop MEFFV C4ISR capabilities within EMW context, integrating SPAWAR/DARPA Technologies. Design C4I software to support both M&S and eventual training applications in far term.



Execution Plan

MILESTONE/EVENT	FY 04 ($.05M)				FY05($.05M)			
1. Liase and document Naval and Joint C4SIR programs and technologies of relevance to MEFFV.	.001	.001	.001	.001				
2.a. C4ISR Roadmap				.001	.003	.002	.002	.002
b. C4ISRCampaign Plan							.006	.002
3. Populate C4ISR Capability Information needs through service and JFCOM games, experiments for Baseline #1.			.025	.02	.005	.003	.003	.003
4. Initiate long range M&S in support of Training objectives.					.004	.003	.003	.003

Payoffs

Establish key MEFFV Interoperability priorities.

Establishes a strategic direction for MEFFV C4ISR architecture, including sensor employment.

Ensures MEFFV interoperability at the joint level.