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# Design of Military Vehicles with the Soldier in Mind: *Functionality and Safety Combined*



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## Report Documentation Page

*Form Approved*  
*OMB No. 0704-0188*

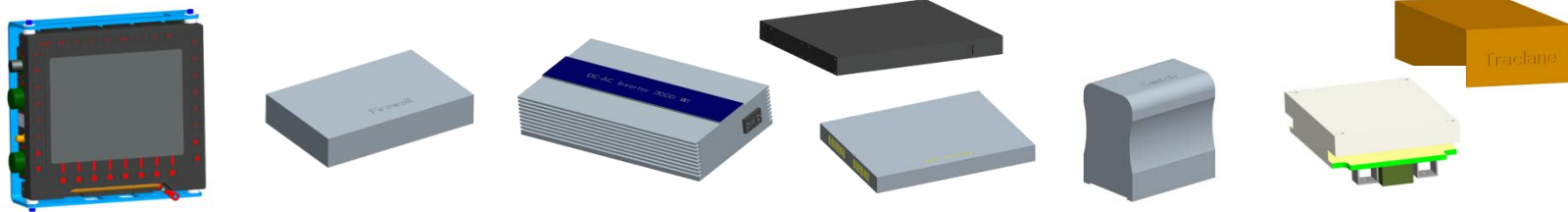
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1. REPORT DATE <b>31 MAR 2011</b>	2. REPORT TYPE <b>N/A</b>	3. DATES COVERED <b>-</b>		
4. TITLE AND SUBTITLE <b>Design of Military Vehicles with the Soldier in Mind: Functionality and Safety Combined</b>		5a. CONTRACT NUMBER		
		5b. GRANT NUMBER		
		5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S) <b>Regina M. Rogers</b>		5d. PROJECT NUMBER		
		5e. TASK NUMBER		
		5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>US Army RDECOM-TARDEC 6501 E 11 Mile Rd Warren, MI 48397-5000, USA</b>		8. PERFORMING ORGANIZATION REPORT NUMBER <b>21658</b>		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) <b>US Army RDECOM-TARDEC 6501 E 11 Mile Rd Warren, MI 48397-5000, USA</b>		10. SPONSOR/MONITOR'S ACRONYM(S) <b>TACOM/TARDEC/RDECOM</b>		
		11. SPONSOR/MONITOR'S REPORT NUMBER(S) <b>21658</b>		
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release, distribution unlimited</b>				
13. SUPPLEMENTARY NOTES <b>The original document contains color images.</b>				
14. ABSTRACT				
15. SUBJECT TERMS				
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT <b>UU</b>	
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>		
			18. NUMBER OF PAGES <b>11</b>	19a. NAME OF RESPONSIBLE PERSON

- Weapons System (control equipment)

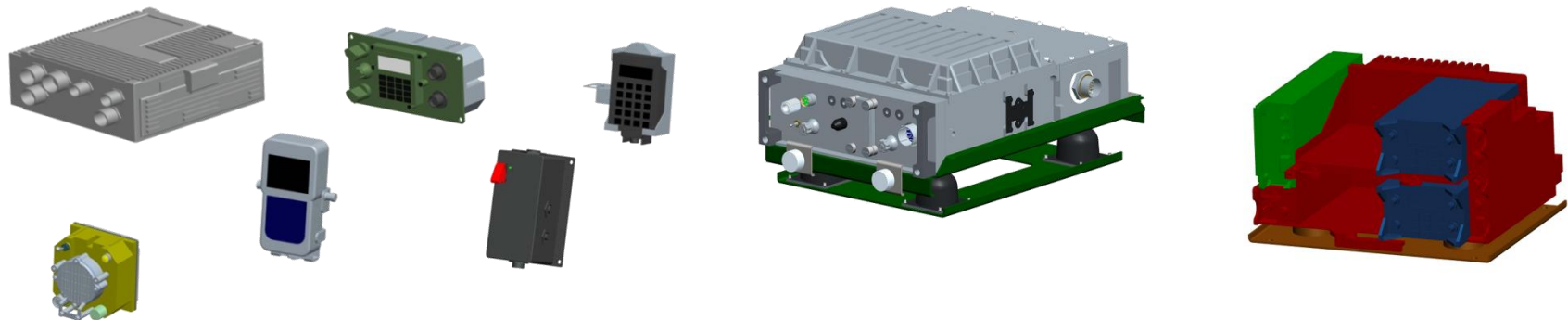


- Power/Data Architecture



- Situational Awareness

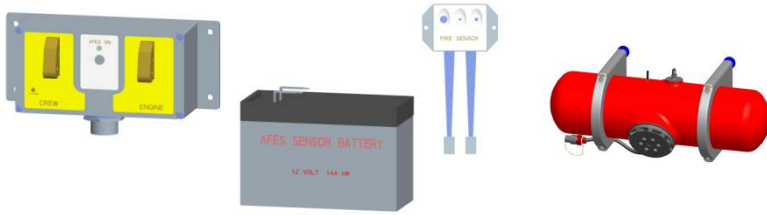
- Communications Equipment



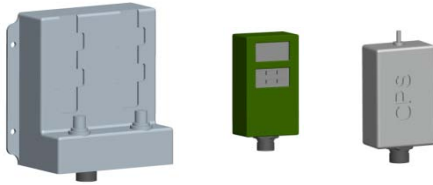
- Day/Night Vision Equipment



- Fire Suppression System



- CBRN Protection System



- Active Protection Systems (control)



- Seats / Restraints



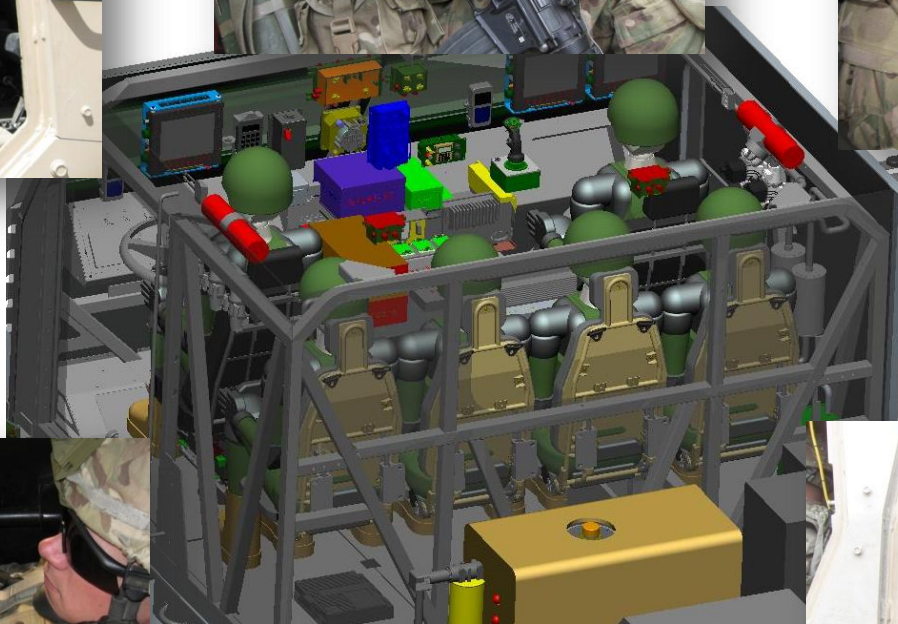
- Energy Absorption Materials



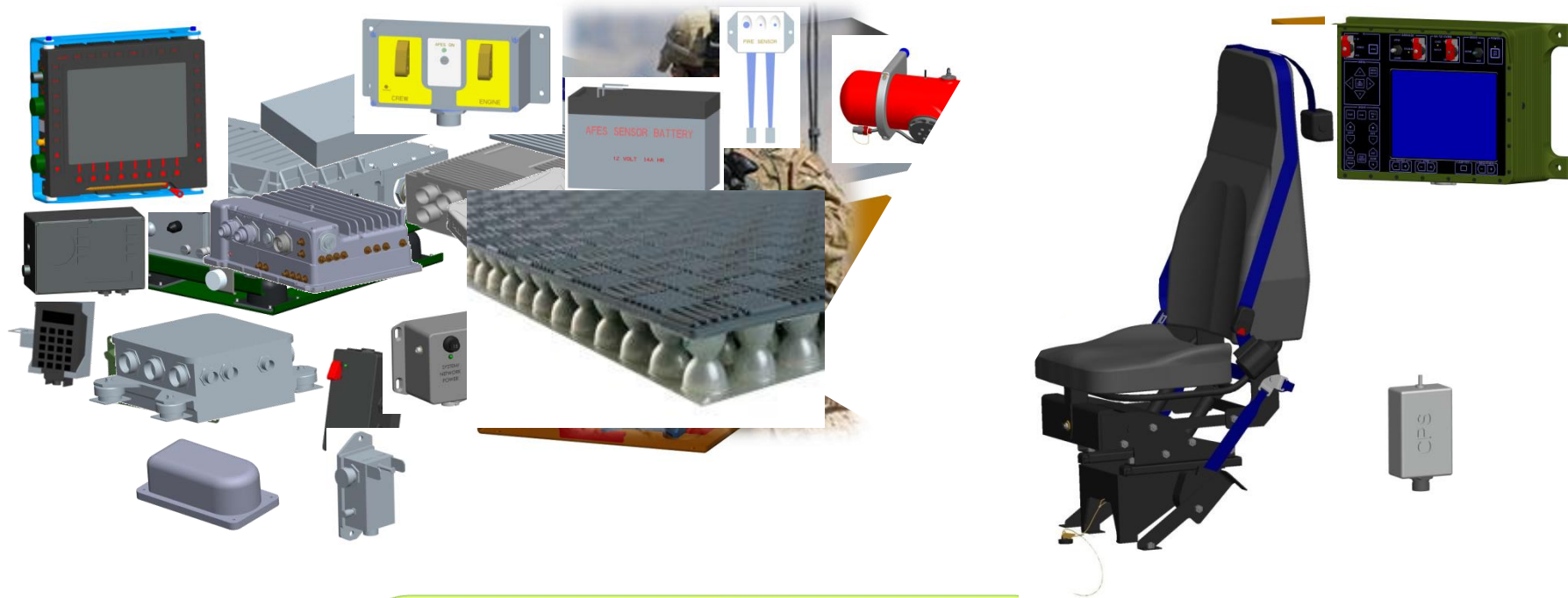


Current Military  
Vehicle Design  
Approach

What does a military vehicle look like using the current approach for vehicle design?

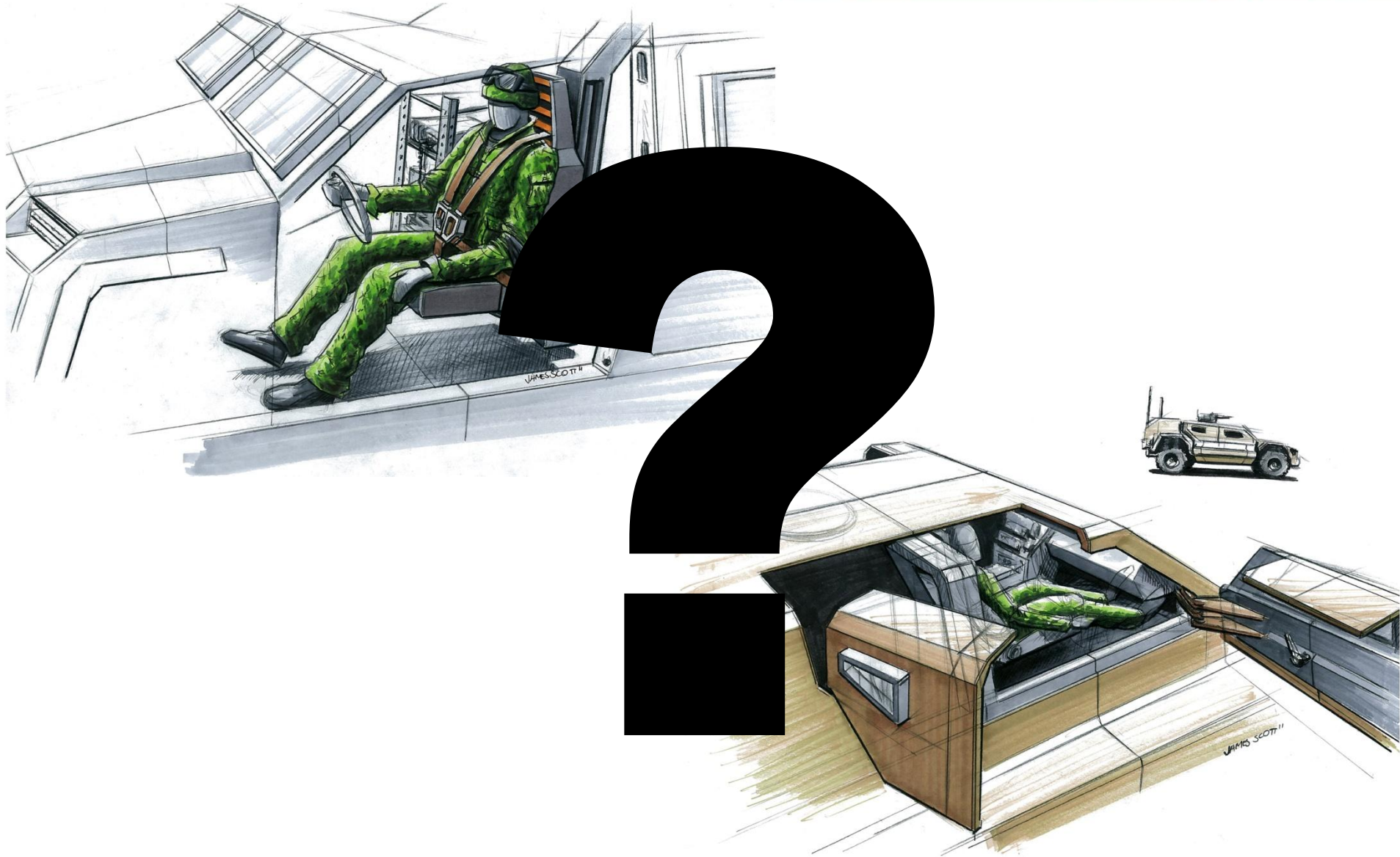


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Future Military Vehicle Design Approach

What does a military vehicle look like using the future approach for vehicle design?



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## CAPABILITY GAP

## CURRENT CAPABILITY

Blast Event

Soldier

OCS Toolbox

Army Ground Vehicle Design

Production & Deployment

Continuous Fleet Performance & Theatre Data Feedback Loop

Understand the blast event:

- Theatre Data
- Vehicle & Injury Battlefield
- Vehicle Forensic Teams & Attack Scene Investigation
- JTAPIC

Understand blast injury:

- Injury Mechanism
- Human/Soldier Response and Tolerance
- Live Human Anthropometry and Response
- Cadaver Testing

Translate event into quantifiable metrics:

- Injury Assessment Reference Values
- Vehicle Response – Force, Stress, and Displacement

Understand the Soldier and their Mission:

- Solider Population
- PPE and Gear
- Human Factors
- Needs /Requirements (TRADOC)

OCS Toolbox:

- Design Guidelines
- Component Specifications
- Sub-System/System Specifications
- Test Procedures
- MIL-STANDARDS

Occupant Protection Systems Integration Laboratory (OP SIL):

- Drop Tower
- Vertical Impact Test Simulator (VITS)
- Head Impact Protection (HIP)
- Linear Impact Sled (LIS)
- Multi-Axis Blast Simulator (MABS)
- Grayling
- Test Dummies
- Instrument Calibration
- WIAMan

VEHICLE M&S and LFT&E

COMPONENT M&S and T&E

MODELING & SIMULATION  
TEST & EVALUATION

SYSTEM M&S and T&E

SUB-SYSTEM M&S and T&E

Soldier Domain:

- Advanced PPE and Gear
- Exterior Technologies:
  - Underbody Kits
  - Panels, inserts, advanced materials
  - Cargo/gear retention
- Interior Technologies:
  - Seats
  - Ease-of-use Belts
  - Energy Absorbing Materials
  - Ingress/Egress
- Sensing and Electronics Technologies:
  - Black Box
  - Internal Sensors
  - Diagnostic Modules

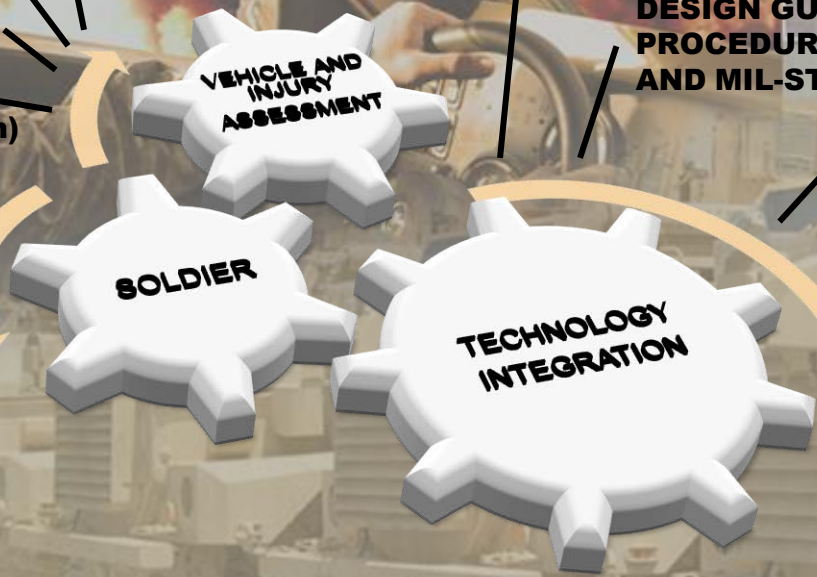




**THEATER DATA – VEHICLE & CASUALTY DATA**  
**INJURY MECHANISM**  
**INJURY ASSESSMENT CRITERIA**  
**TEST DEVICE**  
(HYBRID III → WIAMan)

**MARKET SURVEY & TECHNOLOGY ASSESSMENT**  
**DESIGN GUIDELINES, TEST PROCEDURES, AND MIL-STANDARDS**

**SOLDIER POPULATION**  
**PPE AND GEAR**  
**HUMAN FACTORS**  
**NEEDS & REQUIREMENTS (TRADOC)**



**TECHNOLOGIES**  
➤ **SOLDIER PPE & GEAR**  
➤ **INTERIOR**  
➤ **EXTERIOR**  
➤ **SENSING & ELECTRONICS**  
**MODELING & SIMULATION**  
**TEST & EVALUATION**  
**VALIDATE & ACCREDITATE**  
**TRANSITION TECHNOLOGY**

**OCS Mission: D4W - Design for the Warfighter**



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THANK YOU!

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