MSTV Mini-Symposium Preview

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TARDEC-RBG-CASSI

12 August 2009
**Report Documentation Page**

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12. DISTRIBUTION/AVAILABILITY STATEMENT

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13. SUPPLEMENTARY NOTES


14. ABSTRACT

15. SUBJECT TERMS

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17. LIMITATION OF ABSTRACT

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18. NUMBER OF PAGES

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CASSI’s Role In Systems Integration

Mission:
- Provide Rapid Assessment and Integration Services to both Technology and System/Platform Development Programs
  - Throughout the Lifecycle (Rqts – Tech – Int’n – Demo – Prod – Sust – PiP)
  - Consider Warfighter, System, and System-of-Systems Contexts

Objectives:
- Provide Systems/SoS Perspective to Combat Developer, PM and Tech Developer on Requirements, Tradeoffs & Integration
- Provide SWAP, Performance, Operational, Cost, & Sustainment Impacts
- Provide and Share Configuration Managed Data on Technologies, Systems, M&S and related programs/processes
- Explore Multiple Options and Trades Rapidly

Methods:
- Develop Vehicle Concepts & Perform Concept Analysis and Trade Studies
- Perform System Assessments using Physics-based, Statistical-based, HW/Man-in-the-Loop, and Distributed Simulation Tools
- Develop Integrated System Level Demonstrators
CASSI Functions

**Advanced Concepts**
- Future Force
- MRAP
- JLTV
- FTTS

**Analytics**
- Thermal / CFD
- Crew Safety
- Structures/Durability
- Blast
- Dynamics

**Hardware & Man-In-The-Loop Simulation**
- Characterization
- Durability
- Turret Testing
- Human Dimension
- Virtual Environments

**Integration & Demonstrators**
- FTTS
- CAV
- FED

**HPC & Data Management**
- HPC
- CAV
- ACE

**Human Dimension**

**Virtual Environments**

**Characterization**

**Durability**

**Turret Testing**

**Human Dimension**

**Virtual Environments**

**Future Force**

**MRAP**

**JLTV**

**FTTS**

**Thermal / CFD**

**Crew Safety**

**Structures/Durability**

**Blast**

**Dynamics**

**FTTS**

**CAV**

**FED**

**HPC**

**CAVE**

**ACE**

**12 August 2009**

UNCLAS: Dist A. Approved for public release
MSTV VIP Speakers

Mr. Scott Rutter – *BAE Systems*
Business Development Director
*Modeling and Simulations: Meeting the Needs for the Future Force*

Mr. Scott Stilson – *General Dynamics Land Systems*
Chief Engineer, Stryker Modernization (S-Mod) Program
*The Application of Modeling and Simulation to the S-Mod Program*
Power and Energy/Mobility Session
Mr. Mike Pozolo – TARDEC
Dr. James Critchley – BAE Systems

*Interior Permanent Magnet Machine for Use in the XM1124 Hybrid Electric HMMWV*
Justin Owen and Mike Marcel – DRS Test & Energy Management, LLC
Wes Zanardelli – TARDEC

**Simulation-based Design for Actively Controlled Suspension Systems**
Joseph H. Beno, Damon A. Weeks and Jason R. Mock – University of Texas

**Fuel Economy and Mobility of Multiwheel Drive Vehicles**
Jeremy Gray – TARDEC
Vladimir Vantsevich – Lawrence Technological University

**A Modular Model Architecture in Modelica for Rapid Virtual Prototyping of Conventional and Hybrid Ground Vehicles**
John Batteh & Michael M. Tiller – Emmeskay

**Family of Medium Tactical Vehicle Transmission Fuel Economy Study: Evaluation of AMT Performance Using Experimental and Analytical Methods**
Matt Van Benschoten & Evan Nelson – Roush Industries

**Time-dependent Simulation Methods for Vehicle Thermal Management**
Dr. Ilhan Bayraktar – Oshkosh Corporation
A Robust Durability Process for Military Ground Vehicles
Nammalwar Purushothaman, Paramsothy Jayakumar & James Critchley – BAE Systems
Sandip Datta & Venkat Pisipati – TAC World Wide

Dan Ghiocel – GP Technologies, Inc.
Dan Negrut – University of Wisconsin
David Lamb & David Gorsich – TARDEC

Influence of Loading Distribution of M1 Suspension on Predicted Track System Durability
David Ostberg & Bill Bradford – TARDEC

Vehicle Prognostics: Understanding Usage Severity and Potential Damage Accumulation for Combat Vehicle Suspension Components
Mark Pompetzki & Brian Dabell – HBM-nCode Products
Joseph Gothamy & Jim Bechtel – TARDEC

Reliability and Complexity of Unmanned Ground Vehicles
Arati Dixit & Dr. Harpreet Singh – Wayne State University
Grant R. Gerhart – TARDEC
Human Dimension Introduction — The Army’s Need for Cognitive Engineering
Kaleb McDowell – ARL
Harry J. Zywiol Jr. – TARDEC

The Utility of a Ride Motion Simulation in a Neuroergonomic Approach to Systems Design
Kelvin S. Oie – ARL
Victor Paul – TARDEC

Understanding Soldier Tasks for Effective Simulation
Teena Garrison & Mark Thomas – Mississippi State University

Simulating Crew Ingress and Egress for Ground Vehicles
Matthew P. Reed – University of Michigan

Introduction of a Ground Vehicle Integrated Thermal Model
Jing Pang, Daniel Chue & Mark Rupersburg – GDLS

Development of a Validated Thermal Model of Air Conditioning Performance in a Ground Vehicle
Joshua Pryor, Julia Mao, Aaron Ditty & Pete Rynes – ThermoAnalytics
Rob Smith – TARDEC
Hardware-in-the-Loop Session

Mr. Scott Lohrer – TARDEC
Mr. Wilford Smith – SAIC
Dr. TC Lin – BAE Systems

A Reconfigurable HIL Test Stand
Ashok Nedungadi & Karl Kreder – Southwest Research Institute

A Combat Systems Integration Lab for Engineering Life Cycle Support
Dr. Kevin Chang, Christopher Johnson, TC Lin, Kasra Naghshineh, Sun Kwon & His Shang Li – BAE Systems

Investigation of Control Algorithms for Tracked Vehicle Mobility Load Emulation for a Combat Hybrid Electric Power System
Jarrett Goodell & Wilford Smith – SAIC
Byron Wong – TARDEC
Simulation-based Reliability Systems: A University/Industry Consortium Focused on Simulation-based Solutions for Ground Vehicles

Roger L. King – Mississippi State University
Paul Decker & David Gorsich – TARDEC

Structural Topology Optimization for Blast Mitigation Using Hybrid Cellular Automata

John Goetz, Huade Tan, Andres Tovar & John E. Renaud – University of Notre Dame

System Design by a Network of Optimizations

Dr. Jim He – Michigan Engineering Services, LLC
Christopher G. Hart & Nickolas Vlahopoulos – University of Michigan

A Probabilistic Multidisciplinary Design Optimization Approach with Application to Ground Combat Systems Design

Vik Ganesan – GDLS

Assessment of a Bayesian Model and Test Validation Method

Y. Pai, Michael Kokkolaras, Gregory M. Hulbert & Panos Papalambros – University of Michigan
Mike Pozolo – TARDEC
Y. Fu, R.J. Yang & S. Barbat – Ford Motor Company
Written-only Papers

**Engine, Battery, and Vehicle Simulation Strategies for Transmission Testing**
Bryce Johnson – HORIBA Instruments, Inc.

**Analysis of Spinal Compression in Blast Environments**
James Eridon – General Dynamics Land Systems

**Applicability and Simulation of Federal Automotive FMVSS Standards in Light Military Vehicle Occupant Protection Development**
Nripen Saha and Mark Rupersburg – General Dynamics Land Systems