



# Stryker DVH LFT&E

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# The Stryker Family of Vehicles

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- Stryker Family of Vehicles
  - medium-armored combat systems.
  - 2 variants: Infantry Carrier Vehicle (ICV) and Mobile Gun System (MGS).
  - 7 ICV-based configurations: Reconnaissance (RV), Medical (MEV), Command (CV), Engineer Support (ESV), Anti-tank Guided Missile (AT), Fire Support (FSV), and Mortar Carrier (MCV) Vehicles
- Originally subjected to a comprehensive Title 10 oversight LFT&E program
  - Multiple sub-system tests, M&S, and over 90 FUSL events to support an assessment of Stryker vehicle vulnerability to the full spectrum of threats.
- Stryker vehicles in Afghanistan initially equipped with kits, to include a flat-bottom underbelly plate and energy attenuating seats for selected positions.



# The Stryker Double-V Hull



M1126 Infantry Carrier Vehicle



M1129 Mortar Carrier Vehicle



M1130 Commanders Vehicle



M1131 Fire Support Vehicle



M1132 Engineer Squad Vehicle



M1133 Medical Evacuation Vehicle



M1134 Anti-Tank Guided Missile Vehicle

- OEF commanders determined OEF-kitted flat-bottom Stryker vehicle survivability was inadequate for operations in Afghanistan.
- The Stryker DVH program resulted in response to the OEF operational need for increased IED protection for Stryker vehicles.
  - Stryker DVH systems expected to retain their unique mission capabilities, but incorporate multiple design changes that are intended to holistically contribute to improved survivability against the IED threat.
- Program acquisition strategy calls for the procurement of two Stryker DVH brigade sets – along with training and spare assets.
- There are 8 different DVH configurations (ICVV, ICVV-Scout, CVV, MEVV, ATV, FSV, ESV and MCVV) .



# Stryker Double-V Hull LFT&E

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- The Stryker DVH LFT&E program was designed to do the following prior to deployment:
  - Confirm that the DVH improves Stryker system IED protection
  - Characterize DVH capabilities beyond threshold and objective threats
  - Examine configuration-unique vulnerabilities
- The DVH program developed, tested (confirming significantly increased IED protection) and began deploying systems within approximately 18 months.
- The scope of the LFT&E program includes a total of 47 events, that span different vehicle configurations, as well as IED threat types and sizes.
- To date, 41 events have been executed and 6 remain.

**Aligned with Director's initiative to field new capability rapidly.**



# DVH Bottom Line Operational Evaluation

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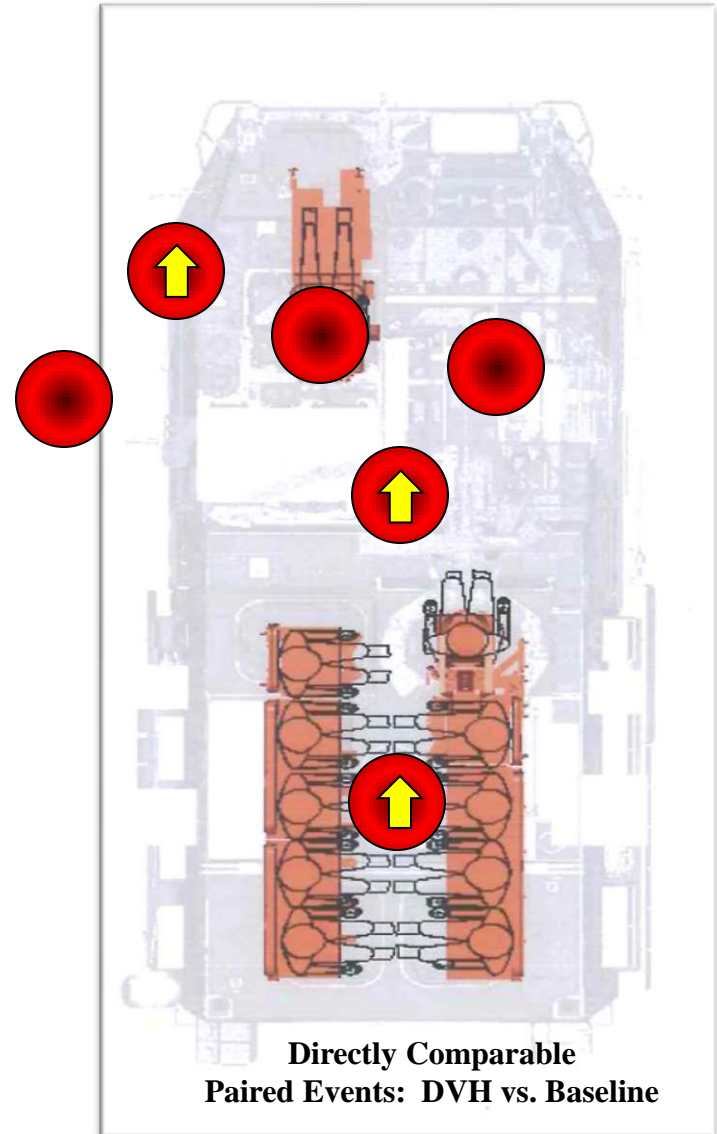
- Test Adequacy: Conducted over Afghan-like terrain at Yuma Proving Ground (YPG) in accordance with DOT&E approved test plan
- Operational Effectiveness
  - Unit was able to successfully complete all missions
  - Mobility
    - Improved Vehicle handling and braking on flat terrain
    - No operationally significant degradation to DVH mobility on level rocky or soft soils
    - Slight increase of no-go terrain (slopes and soft soils) but no observed operational impact



# Key Pillar of DVH LFT&E Program

- **Initial Comparative Assessment to Support ICV Fielding**

- 12 events: Establish baseline IED protection capability of the OEF-kitted flat-bottom Stryker vehicles in theater.
- Comparable DVH test series against DVH structures and prototypes to support an initial comparative mapping of underbody and side IED protection.
- DVH ICV production representative FUSL testing to confirm performance.





# DVH Bottom Line Operational Suitability

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- **Reliability (RAM)**
- **Improved suspension is more reliable**
  - **DVH – 985 Miles driven during OE**
    - **0 System Aborts**
    - **985 MMBSA, 612 MMBSA 80% Lower Confidence Limit**
  - **OEF – 897 Miles driven during OE**
    - **3 System Aborts**
    - **299 MMBSA, 163 MMBSA 80% Lower Confidence Limit**
- **Maintainability**
  - **Greater access to suspension for both PMCS and repair without mine protection kit**
- **Driver's Compartment is not suitable**
  - **Driver's seat latch does not allow timely evacuation of the driver.**
  - **Not readily accessible for CASEVAC through driver's hatch (fleet-wide issue with Strike Shield installed).**
  - **Vehicle strut and energy attenuating shock tower protrude into the driver's space.**
  - **Seat pad does not provide adequate cushioning for the driver.**



# Enabling Factors: DVH LFT&E

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- **Efficient, collaborative, focused IPT process**
  - Established clear evaluation objectives
    - Commanders requested improved IED protection for Stryker vehicles in Afghanistan, narrowing the LFT&E program's focus to system capability against a specific set of threats.
  - Collective reviews of combat data
    - Strike-point information influenced and validated the scope of the test program
    - Crosswalks (ARL/NGIC/JTAPIC partners) enable comparisons of test data to combat incidents information, further validating the program's test scope and improving our understanding of the threat and test limitations.
  - Streamlined processes for unprecedented data transfer rates (crew injury and vehicle damage reports) enabled timely assessments to the PM and commanders in support of deployment dates and unexpected vulnerabilities requiring fixes.





# Critical Enabling Factors: DVH

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- DVH Performance
  - Flexibility in system's design space
    - C-130 requirement waived, eliminating associated design constraints
  - Robust systems engineering and design practices
    - Both test and M&S supported the development of the material solution
- Extremely high-visibility program
  - Oversight: USD AT&L, OSD Director OT&E, VCSA
    - Assessment reports required prior to the fielding of each DVH configuration
  - Intense pressure to execute test and evaluation in a timely manner
  - Drove prioritization (in favor of DVH) across Army T&E activities



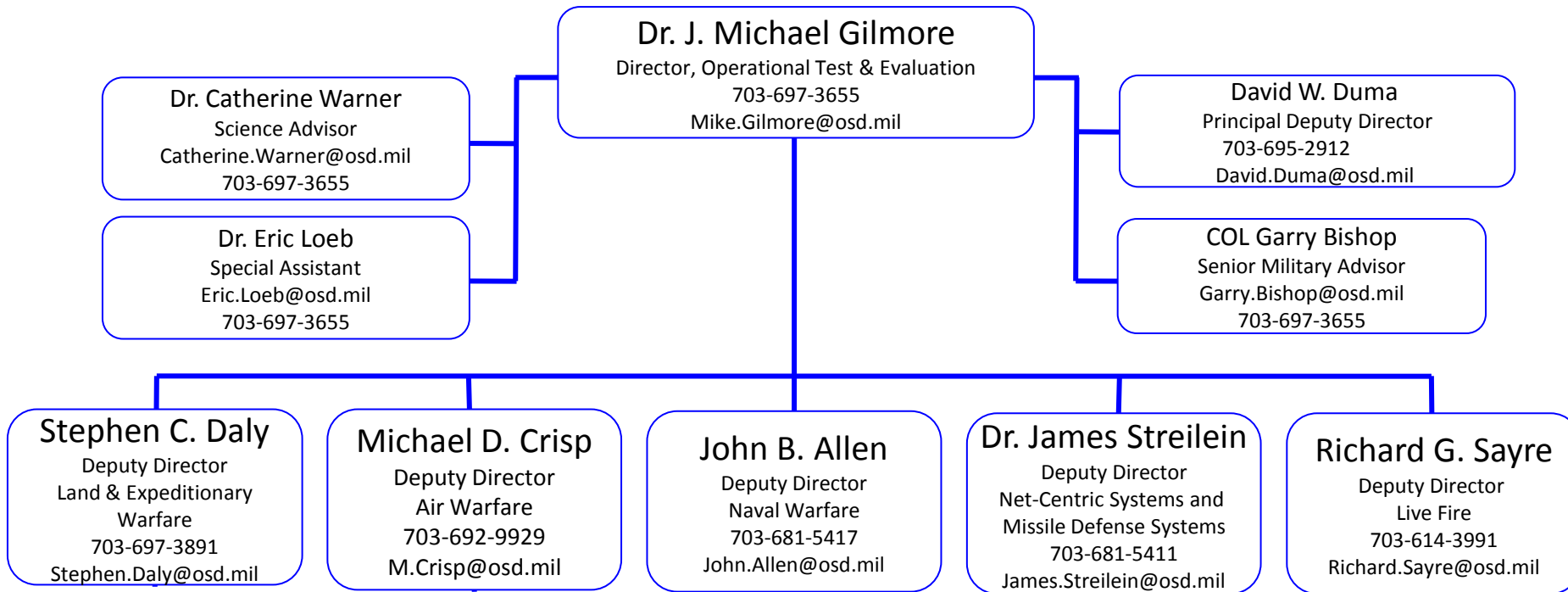
# Enabling Factors: DVH

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- **Adequate T&E resources**
  - Test Execution
    - Adequate number of Test assets (baseline flat-bottom vehicles; DVH structures, prototypes, production representative configurations; Operational test assets and Live Fire test assets).
    - ATC/PM/contractor coordination for repairs and spares
    - Maximum complement of instrumentation to capture as much crew injury and vehicle response data as possible.
  - Evaluation support
    - ARL/ATC/FSR vehicle damage assessments
    - ARL/SLAD crew injury assessments
    - TRADOC BDAR Office Battle Damage, Repair and Recovery assessments



# DOT&E Organization



<https://extranet.dote.osd.mil>