

**Update Report to the ISSA White Paper Series on Considerations on Defense Force
Personnel Survivability in Vehicle Incidents Under Urban Warfare Conditions**

**Some Progress, But Major Failings, in Getting Viable
Survivability Systems into New US Armed Forces Vehicles**

A Report by
ISSA

The International Strategic Studies Association

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US military personnel fighting in Iraq and Afghanistan remain at high risk from enemy action and vehicular accidents because of continued failures to make armored and soft-skinned vehicles compliant with recommended approaches to human survivability. The failures apply equally to the new vehicles being manufactured under an urgent basis for the Mine Resistant Ambush Protected (MRAP) family of vehicles and to the existing HMMWV soft-skinned vehicles and other general purpose vehicles in-theater.

The US Army and Marine Corps continue to have as their highest equipment priority the mission of deploying new and upgraded armored and soft-skinned tactical wheeled vehicles to troops in harm's way in Iraq and Afghanistan.

Major omissions in survivability systems, highlighted in ISSA White Paper Reports of June 11, 2007, June 21, 2007, and July 3, 2007, have begun to be addressed by the US Army and USMC.

Despite the best efforts of US Army and USMC program personnel on the MRAP family of vehicles to ensure maximum compliance by vehicle manufacturers with regard to human survivability specifications, however, attempts by platform manufacturers to field new systems as quickly as possible have resulted in the reality that the intent and the stated requirements of the Department of Defense to get maximum protection for US troops continue to be violated. Manufacturers have continued with the process of the deliberate selection of untested, and often patently dangerous (even potentially lethal), seating and restraint systems on many of the MRAP vehicles.

At the same time, no progress has been made in fitting personnel survivability systems, other than up-armorings, to protect troops using M1114 and other HMMWV soft-skinned vehicles in-theater in Iraq or Afghanistan against improvised explosive device (IED) and other attacks.

Vehicles displayed by manufacturers at the USMC's Modern Day Marine exposition (October 2-4, 2007) and the Association of the US Army (AUSA) Show (October 8-12, 2007) demonstrated that most troop seating in MRAP prototypes and other vehicles failed to offer the requisite seating and restraint protection for troops to protect them against two-stage energy attenuation (EA) following blast. This is in direct violation of the military's program directives insisting that such protection be afforded, and that the protection meets the currently anticipated threat levels.

Some of the seating for the MRAP family of vehicles will shortly undergo comprehensive testing at the ARCCA facility in Pennsylvania¹, but most of the seating systems being installed in US military vehicles have never been tested, and patently do not meet even basic US highway safety standards, let alone the far more rigorous requirements of combat operations. Several manufacturers have begun using fully-tested seats, such as the Global Seating Systems (GSS) CCOPS *Cobra* seats and restraint systems in MRAP vehicles, but not in all crew positions.²

Options now exist for the installation — retrofitting — of seating and restraint systems into currently-operational M1114 vehicles in-theater in Iraq and Afghanistan, a move which would substantially improve personnel survivability. Retrofit into operational M1114s of the CCOPS system, the only seat and restraint system to have been fully tested at this point, would substantially reduce injury numbers and severity, and unnecessarily reduce deaths as a result of IED blast and operational attacks and accidents. Significantly, this seating/restraint system also has substantial benefits for frontal collision, rollover, and other problems caused either by accident or combat action.

One Marine Corps source noted: "At best, we see manufacturers — when they even think about the problem — shooting to provide an 'eight pound solution' [providing blast protection against eight pounds of IED explosive], even though we're really functioning in a 12 pound threat environment." Apart from that, the direct blast

¹ ARCCA Incorporated, 2288 Second Street Pike, Penns Park, PA 18943. www.arcca.com.

² The CCOPS *Cobra* seating system was developed under contract with the US Army National Automotive Center at the Detroit Arsenal and is currently produced by Global Seating Systems LLC, of Exton, Pennsylvania. See earlier ISSA White Papers on Personnel Survivability for more complete details. Some additional details available at www.globalseating.com.

protection — the armor — fails to address the entire spectrum of problems which arise from IED or other blast situations, or from normal exposure to accidents in the vehicles.

ARCCA was tasked by the MRAP program to undertake tests only of the driver seats for the Force Protection (FPI), International Truck & Engine (ITE), and General Dynamics (GD) MRAP platforms. This at least advances the process whereby some of the seating systems — including CCOPS, which has already been rigorously tested and which was designed to an Army specification — will be held to some standards, but many seating and restraint systems being fitted to US military vehicles remain outside any testing validation.

Those outside the testing regime include, for example, seating made by Armorworks, and seats being proposed (but not yet selected for MRAP or light vehicles) by German firm Autoflug³. The International Truck & Engine (ITE)⁴ MRAP passenger seat, for example, also needs to be tested. It is an Israeli Plasan Sasa low-back seat design with flat cushion which is suspended from the roof with ropes. This may do well in blast testing but would almost certainly not pass crash testing; moreover, it does not meet the warfighting requirements of the MRAP vehicle family which requires rapid vehicle ingress and egress, not only for drivers, but for vehicle commanders and troops.

The reality is that while the US Army and Marine Corps now fully understand the realities of blast attenuation in addressing the secondary effects of IED attacks, the vehicle manufacturers are, by and large, still ignoring the requirement to incorporate appropriate design and technology changes into their vehicles' internal survivability systems. The billions of dollars being committed for urgent production of new US military vehicles to protect troops against IED blast are largely being wasted because the internal seating and restraint systems often pose greater risk of death or injury to the troops than the blast itself.

It has now become a matter of urgency that:

1. The US Congressional oversight functions begin to enquire more closely into manufacturer compliance with the intent and letter of MRAP specifications for seating and restraint systems which demand attention to blast attenuation and crash survivability, and to consider the legal liability of manufacturers whose systems place vehicle occupants at unnecessary risk;

³ Autoflug currently provides specialized seating for US M1A1 *Abrams* main battle tanks.

⁴ International Military and Government, LLC, a wholly owned subsidiary of International Truck and Engine Corporation, was named in January 2007 as a finalist for the provision of up to 4,100 MRAP vehicles to the US Marine Corps.

2. The Department of Defense elevate the priority of retrofitting of in-theater M1114 HMMWV vehicles to the same level as the provision of new MRAP vehicles; and
3. The Department of Defence and the MRAP program office insist on full testing of all seats — driver, commander, and personnel seating — to be installed in MRAP and other military vehicles, to ensure that the seating meets the anticipated threat levels, not only with regard to direct effects of blast, but also addressing two-stage blast attenuation, frontal collision, and roll-over.

Further Information:

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