

NOT FOR PUBLICATION UNTIL RELEASED BY
THE HOUSE ARMED SERVICES COMMITTEE

STATEMENT

OF

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COMMANDING GENERAL
MARINE CORPS SYSTEMS COMMAND

BEFORE THE

HOUSE ARMED SERVICES COMMITTEE

TACTICAL AIR AND LAND FORCES SUBCOMMITTEE

AND

READINESS SUBCOMMITTEE

ON

MARINE CORPS BODY AND VEHICLE ARMOR

1 FEBRUARY 2006

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Chairman Weldon, Chairman Hefley, Congressman Abercrombie, Congressman Ortiz, and distinguished members of the Subcommittees, it is my honor to provide an update on the Marine Corps' efforts to provide the most capable armor systems in the world for the individual Marine and for our tactical wheeled vehicles. On behalf of all Marines and their families, I first want to thank you for your continued support of our warfighters during this very challenging time.

BODY ARMOR

HISTORY OF MARINE CORPS BODY ARMOR

Providing ballistic personal armor protection to our warfighters has been a critical, iterative, and Joint-Service process. The Marine Corps' over-arching strategy since the start of Operation Enduring Freedom (OEF)/Operation Iraqi Freedom (OIF) has been to ensure that 100 percent of the Marine Corps' requirement for individual protection is met with the best armor protection available – and we succeeded. This protection is known as the Interceptor Body Armor System, which includes the Outer Tactical Vest (OTV) and the Small Arms Protective Inserts (SAPI), and was designed to provide the necessary levels of personal protection to known and anticipated threats. The SAPI plate capability has matured through three generations as the threats have been better understood.

When the Marines entered into Iraq for the first time in March 2003, 100 percent of the I Marine Expeditionary Force's (MEF) requirement for the OTV and SAPI was provided. This commitment to individual protection has continued through all subsequent Marine rotations into Iraq. For example, upon our return to Iraq for OIF II on March 19, 2004, the Marine Corps fielded to I MEF's ground forces a series of additional body armor components such as extremity body armor, lightweight helmets, and ballistic goggles based upon reports and requirements received from Marines who fought in OIF I.

The Marine Corps has been able to continually and immediately provide improved personal protection equipment to our warfighters as more capable systems have been developed by our dedicated manufacturing base in concert with emerging warfighter requirements. As a result, 100 percent of our Marine ground forces have this improved personal protection equipment as they rotate into theater.

The Marine Corps has always been realistic about the capabilities of our protective equipment on the modern battlefield. Awareness of the vulnerability of our warfighters taking hits on the side of their torso was addressed through modifying our Tactics, Techniques, and Procedures, or TTPs – changing the off-hand firing position to a more direct frontal shooting stance. However, we know there is no one absolute TTP that can counter changing enemy threats.

Therefore, in December of 2004, the Marine Corps Systems Command (MARCORSYSCOM) contracted the Armed Forces Institute of Pathology (AFIP) to evaluate data collected from autopsies performed on Marines in order to corroborate or redress our perception of the threat.

OEF/OIF I/OIF II is the first time in U.S. history that all wartime casualties have been autopsied by AFIP to determine a cause of death. A preliminary report containing lethality data relative to Marine casualties was received in March 2005, and an updated report was received in August 2005. The primary purpose of the report was to analyze casualty data and assess areas of vulnerability in our entire body armor system with the intent of identifying areas for enhancement. While the report confirmed what we thought to be true, that side torso protection should be added to our body armor system, the report is constrained in that AFIP could not assess other vital considerations such as the risk of heat exhaustion of the individual Marine, the loss of agility/mobility from additional body armor weight, or classify the Improvised Explosive Device (IED) blast size to ascertain if body armor could have prevented a loss of life. Given the limitations of the available data, the report does provide the level of detailed analysis for which it was commissioned. What the report cannot do is address the significant fact that countless lives have been saved by the ballistic body armor our Marines wear today.

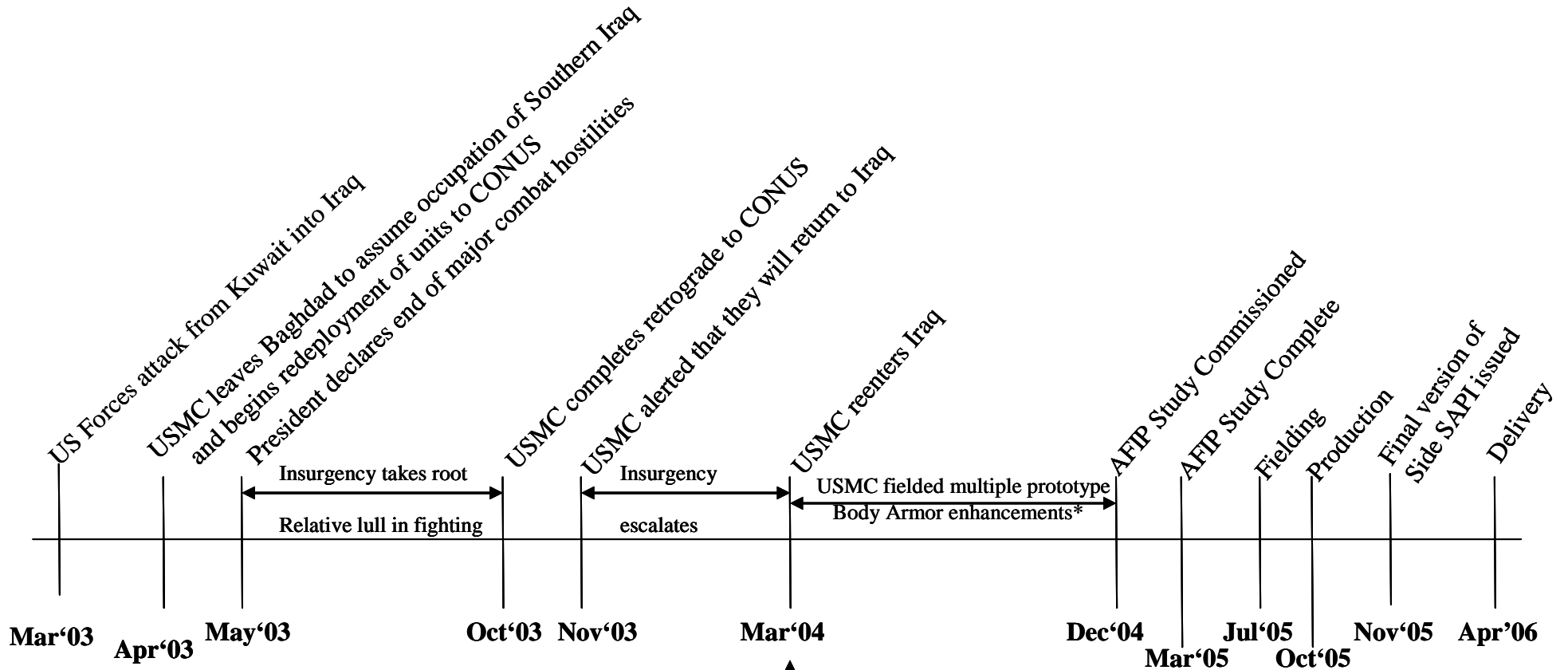
After MARCORSYSCOM examined and weighed the initial report results of March 2005 and relayed our recommendations to Headquarters Marine Corps and the Fleet Marine Force, the Marine Corps modified its requirement in June 2005, concurrent with an Urgent Universal Needs Statement for a side SAPI capability submitted by II MEF forward. At this same time, an additional (informal) request for side torso protection came from 2nd Force Reconnaissance Company, who was preparing to deploy to Iraq. Within 30 days, MARCORSYSCOM purchased all available extra-small SAPI plates (500 sets), developed

interim carriers, and sent them to II MEF. We also immediately began the process to develop a side SAPI plate capability.

In September 2005, MARCORSYSCOM awarded two contracts for the production of side SAPI plates. We fielded the first production side SAPI plates in November 2005. As of today, the Marine Corps has been able to ship and field more than 14,365 sets to units in theater, and we anticipate meeting the full requirement of 28,800 sets in theater by April 2006. The Marine Corps' side SAPI procurement is clearly a success story, as we went from an initial request for the capability to fielding production side SAPI plates in five months.

The following chart depicts our body armoring timeline since the start of OIF.

OIF Timeline



↑
100% I MEF requirement for OTV/SAPI provided

•USMC prototype Body Armor enhancements included; shoulder protection, frag resistant goggles, leg/lower torso protection, side SAPI, etc.

↑
100% I MEF equipped with OTV/SAPI

↑
First meaningful feedback on nature of wounds encountered during Insurgent Phase of Combat

- 1 months fielded prototype Side-SAPI – 500 sets (Jun-Jul 05)
- 3 month prototype to production – (Jul-Oct 05)
- 6 months fielded OIF USMC Forces Side-SAPI – 14,365 shipped to Theater; 28,800 to be delivered by April 06 - (Nov 05-Apr 06)

There is simply no way to anticipate all enemy tactics and prepare for every eventuality. The challenge of body armor design is a delicate balance between the desired payoff of additional personal safety against the loss of combat mobility and effectiveness due to increased aggregate weight and the potential for heat exhaustion and fatigue. However, as threats and the lethality of enemy snipers and IEDs have increased, we continue to adapt and provide enhancements to our personal protection systems, such as with the side SAPI.

We have always maintained that providing more robust personal protection solutions to our warfighters, and providing these solutions immediately, is of the utmost importance. It is clear from our actions over the last 34 months that the Marine Corps is committed to aggressively matching our equipment to changing threats. Our ability to rapidly modify our body armor system is a testament to this commitment.

TACTICAL WHEELED VEHICLES

HISTORY OF MARINE CORPS VEHICLE ARMOR

The Marine Corps' strategy since the start of OEF/OIF has been to provide immediate armor support to all High Mobility Multipurpose Wheeled Vehicle (HMMWV) variants and all of our other tactical vehicles, such as the 7-ton Medium Tactical Vehicle Replacement (MTVR). Our aim was to ensure that some level of protection be available to 100 percent of our vehicles. Therefore, we embarked upon an evolutionary, or phased, approach. By incorporating direct warfighter input and lessons learned in-theater, we have arrived at a very effective solution given the current warfighting environment – a solution that has clearly already saved lives.

Since the Marine Corps has been in combat in OIF II, our vehicle armor solution has evolved through three generations.

1st Generation

In anticipation of, and in time for, I MEF relieving the 82nd Airborne in-theater on March 19, 2004, 1st generation armor components were provided for 100 percent of I MEF's 3,049 vehicles within 10 weeks of receiving the execution order. This armor protection, defined as Level 3, or fabricated armor, was provided via a Commercial-Off-The-Shelf combination of appliqué panels, 3/16" "L" shaped doors, ballistic blankets, etc. The reason for fielding 3/16"

armor in the 1st generation is that, at the time, it was the best available materiel solution that would fully meet the operational requirement for all 3,049 vehicles to have some level of armoring before going to Iraq. Additionally, in response to an urgent need in April 2004, we fielded 37 export model up-armored HMMWVs to I MEF.

We always made clear the fact that we would pursue a more robust armoring solution as better raw material steel became available -- the result of which is our 2nd and 3rd generations of armor.

2nd Generation

As the war progressed, the Marine Corps pursued the procurement of improved armor components for HMMWVs and other tactical wheeled vehicles – “zonal” armor. This zonal armor consisted of the Marine Corps depot-built 3/8” rolled homogeneous armor (RHA), defined as Level II armor because it is “kit” armor. Eventually, more than 4,100 vehicles were fielded to I MEF in support of the Global War on Terrorism with upgraded Level II 3/8” armored “L” shaped doors, flanks, underbody, tailgates, rear cab plates, ballistic glass, and gunner shields. In addition, in a joint effort with the Army, the Marine Corps received a Multi-National Corps-Iraq distribution of 200 Add-on Armor kits and more than 400 up-armored HMMWV (M1114/M1116) theater level assets to support our 2nd generation armored vehicles.

Due to extreme usage levels, environmental conditions, and increasingly sophisticated and more powerful enemy IEDs, it became clear that additional improvements to the zonal armor were necessary; thus, the evolution of the Marine Corps’ 3rd generation of armor.

3rd Generation

For non-M1114 variant HMMWVs, this 3rd generation armor consists of integrated kits, known as Marine Armor Kits (MAK). The MAK system is a modular, bolt-on system that can be installed by Marines of any Military Occupational Specialty. MAK systems offer significantly improved protection against the most prevalent threats, including small arms fire, IEDs, and up to 4 pound mine blasts. Because the MAK is kit armor, it is classified as Level 2 armor, even though it provides greater protection than the 2nd generation “zonal” armor.

The MAK is the result of a cooperative engineering design effort between U.S. Army and Marine Corps operators and engineers, designed to take full advantage of the increased

capabilities of the HMMWVA2, and based upon U.S. Army Research Lab Add-on Armor kits. It is important to note that the design of the MAK incorporates lessons learned from testing and in-theater operations.

As we worked toward developing the MAK, we looked at everything that was available and determined that the most timely and cost effective solution to achieve the desired levels of protection was to develop and produce armor kits through our Maintenance Center at Marine Corps Logistics Base, Albany, GA, which began production of the MAK in November 2004. CONUS installation began in December 2004, and OCONUS installation at Camp Al Taqaddum, Iraq, began in March 2005.

Similarly, for our MTRV 7-ton trucks, we have developed what is known as the MTRV Armor System (MAS). This armor system is a permanent modification to our MTRVs, and is therefore classified as Level 1 armor. It is designed for the life of the vehicle (21 years). The MAS is capable of withstanding small arms fire, IEDs, and mine blasts up to 12 pounds. It consists of metal/composite panel armor, with separate cab and troop compartment kits, dependent upon cargo or personnel variants of the MTRV.

Production of the MAS kits began in April 2005. Production of the MARCENT requirement will be completed this month. In-theater installation of the MAS kits began in May 2005 at the Al Taqaddum, Iraq facility. By opening a second installation site in Jahara, Kuwait, we have been able to speed up our installations, and expect to complete the MARCENT installation requirement in May 2006, approximately five months earlier than originally forecasted.

The following charts depict (1) the current state of our vehicle armoring efforts, and (2) where we are going in the future with respect to our vehicle armoring efforts.



MARCENT Current Vehicle Armoring Posture

Since August 2004 all Marine Corps vehicles operating outside the FOBs have been at Level II or better armor protection.

	Vehicle Systems in CENTCOM AOR	OIF O/H	OEF O/H	HOA O/H	Total	Level I	Level II	Level III	Total Unarmored Vehicles not Leaving FOBs
LTV	M1114	950	74	0	1024	1024			
	HMMWV	2950	84	16	3050	0	2986	33	31
MTV	5-ton	122	1	0	123	0	123	0	0
	MTVR	986	13	0	999	625	374	0	0
HTV	LVS	235	0	0	235	0	235	0	0

Note 1: MNC-I and CJTF-76 have provided 458 M1114s to II MEF (Fwd) in OIF and 76 in OEF respectively

Note 2: 487 of the 1748 (446 + 1302) M1114s under contract have delivered; funding for last 524 MIPR'ed to TACOM, 30 day est. for actual contract award

Level I: A wheeled vehicle that is manufactured as an armored vehicle
 Level II: HQDA and Marine Corps approved Add-on-Armor (AoA) kits
 Level III: Hardening of vehicles through fabricated armor (HQDA) approved steel



MARCENT Armor Way Ahead

Currently improving existing HMMWV Level II protection with Level II (plus) protection (MAK) and MTVR Level II protection with Level I protection (MAS).

	Vehicle Systems	OIF Req	OEF Req	HOA Req	MARCENT Req in CENTCOM Theater	Level I	Level II	Level I & II MARCENT Validated Operational Requirement will be Met
LTV	M1114 - M1151/ 52	2715	85	14	2814	2814		Jul 06
	HMMWV	985	45	4	1034	0	1034	Nov 05
MTV	5-ton	122	1	0	123	0	123	Oct 05
	MTVR	889	11	0	900	829	71	May 06
HTV	LVS	236	0	0	236	0	236	Nov 05

Note 1: MARCENT M1114 requirement 2814; data frozen 10 Jul; 542 on hand; 1748 (446 +1302) under contract; funding for the last 524 has been MIP'ed to TACOM, 30 day est. for actual contract award

Note 2: Total validated MARCENT requirement 2814; 2602 as an Operational requirement and 312 as sustainment

Note 3: To date, 605 out of 900 MARCENT MAS kits installed; TQ installation underway, achieved FOC - 10 per week; KU installations underway, achieved FOC - 15 per week; 29 total installs this week

Note 4: HMMWVA2 w/ MAK rotation from CONUS; 878 delivered, 0 this week; 13 in KU pending intra-theater distribution

Note 5: OEF HMMWV rotation of 74 vehicles from KU utilizing same pool of A2s going into OIF; 72 delivered

Note 6: M1114; 487 total delivered; 149 just delivered awaiting intra-theater lift in KU; 229 enroute Honor

Note 7: MTVR Wreckers & Dumps cannot be armored w/ MAS; they are armored with MAK for MTVR thus they will remain at Level II

As of 29 Jan 06

Currently, all of our wheeled tactical vehicles that operate outside Forward Operating Bases are armored at either Level I or Level II. One-hundred percent of our 1,027 M1114s in theater are armored at Level I, and one-hundred percent of our 2,992 HMMWVA2s with MAK in theater are armored at Level II. By September 2006, through a replacement program, we will have 2,814 Level I M1114s and 1,034 HMMWVA2s with MAK in theater.

In support of critical Explosive Ordnance Disposal (EOD) operations, we have already fielded 26 hardened engineer vehicles, also known as Cougars, in support of OIF II. Furthermore, on 21 April 2005, via the Joint Rapid Acquisition Cell, the Deputy Secretary of Defense designated the Marine Corps Systems Command as the joint agent for the procurement of 122 Joint EOD Rapid Response Vehicles (JERRVs), which are very similar to the Cougar, for all joint EOD forces in theater. Thirty-eight of these vehicles are scheduled to be fielded to the Marine Corps. All JERRV deliveries are expected to occur by June 2006.

Again, it is clear from our actions that the Marine Corps is committed to aggressively matching our equipment to changing threats. Our ability to rapidly modify our vehicle armoring systems is another testament to this commitment.

MECHANISMS

The Marine Corps Combat Development Command (MCCDC) is the advocate for new capabilities on behalf of the warfighter, employing a rigorous approach of defining the capability need, ensuring a joint warfighting capability concept is considered, and finally validating that capability need. Although MARCORSSYSCOM and MCCDC maintain a collaborative relationship, it is upon validation of the need that MARCORSSYSCOM formally goes into action and executes fulfilling that capability, with the end result being a fielded system.

Our armor systems, both body and vehicle, currently being fielded by the Marine Corps were not developed in isolation. We reached out to industry for design, development, and production assistance, our sister services to identify areas for joint activities and testing, and to the medical community, when applicable, for their expertise, as we did with the AFIP report for insights into individual body armor protection system.

Most importantly, we constantly query our intelligence personnel as to the most prevalent devices and weapons our enemy is employing so that we focus our efforts on developing protective measures against the highest priority threats. However, this is not to say that we focus

simply on reactive improvements. Rather, we are proactive relative to the enemy's evolving capabilities by continually making improvements to our fielded systems or by developing and fielding new systems.

Continually drawing on our intelligence resources, the expertise of our workforce, and the insights of warfighters who have returned home, positions us to anticipate the needs of the warfighter in theater. This input is essential to our ability to develop and field systems that support current and emerging threat conditions, and it is fundamental to our success on the battlefield. With this input, we can initiate innovative and rapid modifications to our equipment to meet evolving threats and future challenges by orchestrating mixes of solutions to counter changing and growing enemy capabilities.

It is critical to our mission success that we understand the environment in which our fielded systems will operate. We cannot do this without input or feedback from the warfighter. Combat forces feedback has been critical to the development of all of our armoring systems.

THE THREAT AND HOW ADAPTIVE THE ENEMY IS

We are at war with a thinking, adaptive enemy. Our ability to meet the changing capability needs of the warfighter due to an adaptive enemy hinges on our understanding the reasons behind our successes, and failures, in the day-to-day fight. Operational decisions are based upon known, anticipated, and perceived threats.

We have seen the threat posed by enemy IEDs grow progressively – from 60 and 81 mm mortar rounds, to single 122s and 152s, to daisy-chaining large numbers of shells, and finally, to suicide car bombs. While there is no one absolute armor, technology, or TTP that can counter these growing threats 100 percent of the time, we too are adapting, and are providing our warfighters' more and more effective solutions as the threat becomes larger and more severe.

A significant element to any solution we propose or develop has been, and will always be, what the warfighter wants. A solution that is effective in one scenario may simply not be applicable in another. The wartime environment constantly changes and there is no one better suited to determine what would be effective in any given situation than the warfighter. That is why we provide solutions to the warfighter that can be configured to meet varying levels of threats. In the case of body armor, local commanders have appealed to higher headquarters for the ability to determine what piece or pieces of equipment their Marines will be required to wear

as specific mission and environmental conditions dictate. We have answered that call with the modular design for our ballistic body armoring system.

WHERE WE ARE GOING IN THE FUTURE

Recognizing that our enemy is constantly evolving and changing his tactics, we are looking toward the future of armor protection for our warfighters, on an individual level, and that of their vehicles, not just to combat the enemy's current capabilities, but also to prepare ourselves for future adaptations in the enemy's tactics.

First and foremost, we will continue to execute our current armoring requirements. MARCORSYSCOM is poised to execute any new requirements or capability needs that are identified by the warfighter and validated by MCCDC. We make every effort to consider all available options as we work to find solutions to new threats, regardless of whether the solution can be found here or abroad, including opportunities to provide capability enhancements and opportunities for shortening delivery schedules.

THE BOTTOM LINE

We are doing everything we can to ensure the safety of our Marines by providing them the best and most effective body and vehicle armor solutions. The lives of our Marines, sailors, and soldiers are our most precious assets and their preservation through better and more capable equipment has been, and will always be, the singular priority of MARCORSYSCOM. Your support for more robust and timely funds, like those used for our AFIP report, will position the Systems Commands throughout the Department of Defense to continue with proactive approaches to ensuring our warfighters' safety.

We cannot afford to lose sight of the lessons we have learned about our enemy, and about our own capabilities, through the loss of American lives. These difficult lessons were purchased with our young warriors' lifeblood. They are too precious to forget and we will remember them as we move forward. With your continued support, we can ensure our Marines are ready for the current fight, as well as any future fights. Thank you.