

STATEMENT  
OF  
BRIGADIER GENERAL MICHAEL M. BROGAN  
COMMANDER  
MARINE CORPS SYSTEMS COMMAND  
BEFORE THE  
SEAPOWER AND EXPEDITIONARY FORCES SUBCOMMITTEE  
AND  
AIR AND LAND FORCES SUBCOMMITTEE  
OF THE  
HOUSE ARMED SERVICES COMMITTEE  
ON  
MARINE CORPS FORCE PROTECTION EFFORTS  
17 MARCH 2010



**Brigadier General Michael M. Brogan**  
**Commander, Marine Corps Systems Command**



Brigadier General Brogan is a native of Orrville, Ohio. In May 1980, he graduated from the University of Notre Dame with a Bachelor of Science degree in Chemical Engineering and was commissioned a Second Lieutenant. Following graduation from the Basic School, he completed Assault Amphibian Officers' Course as the Honor Graduate and was assigned as an Assault Amphibious Platoon Commander, Company D, 3d Assault Amphibian Battalion (3d AABn), 3d Marines, 1st Marine Brigade, Marine Corps Air Station, Kaneohe Bay, Hawaii. After returning from deployment to the Western Pacific in support of Battalion Landing Team 1/3, he was reassigned in August 1982 as the Maintenance Management Officer and Assistant Logistics Officer, 1st Battalion, 3d Marines and completed a second Western Pacific deployment.

In January 1984, Brigadier General Brogan reported to Marine Barracks, Naval Weapons Station, Yorktown, Virginia where he served consecutively as a Guard Platoon Commander, Operations Officer, Guard Officer, and Executive Officer. He transferred to Quantico, Virginia in July 1987 and attended the Advanced Communications Officer Course. Following graduation as an Honor Graduate in June 1988, General Brogan reported to 3d AABn, 1st Marine Division and became the Assistant Logistics Officer. In March 1989, he assumed command of Company A, 3d AABn. During Desert Shield and Desert Storm, the company supported 1st Battalion, 5th Marines and was a part of Task Force Ripper.

In June 1991, Brigadier General Brogan assumed duties as the Logistics Officer at the Amphibious Vehicle Test Branch (AVTB), Camp Pendleton, California. While at AVTB, he completed work on a Master of Arts Degree in Business and graduated with Distinction from Webster University. He also attended the 20-week Program Management Course at the Defense Systems Management College, Fort Belvoir, Virginia. General Brogan returned to Quantico, Virginia in July 1994 as a student. A Distinguished Graduate of the Marine Corps Command and Staff College, he reported to the Office of the Direct Reporting Program Manager, Advanced Amphibious Assault (DRPM AAA) in June 1995, to serve as the Survivability Project Officer. In June 1998, he became the Program Manager for the Advanced Amphibious Assault Vehicle Survivability Program.

Brigadier General Brogan reported to 1st Marine Division, Camp Pendleton, California in June 1999 and assumed command of 3d AABn. In July 2001, he transferred to the National Defense University, Fort McNair, Washington, DC as a student in the Industrial College of the Armed Forces (ICAF). General Brogan graduated from ICAF in June 2002 with a Master of Science Degree in National Resource Strategy. He reported to the Marine Corps Systems Command, Quantico, Virginia and was assigned as the Product Group Director, Infantry Weapons Systems. In February 2004, General Brogan reported to the Office of DRPM AAA for duty as the Expeditionary Fighting Vehicle Program Manager. In September 2006, Brigadier General Brogan became the Commander, Marine Corps Systems Command.

Brigadier General Brogan's personal decorations include: the Meritorious Service Medal with Gold Star, the Navy Commendation Medal with Gold Star, the Navy Achievement Medal and the Combat Action Ribbon.

Chairman Taylor, Chairman Smith, Congressman Akin, Congressman Bartlett, and distinguished members of the Subcommittees, I am honored to appear before you today and for this opportunity to discuss Marine Corps force protection systems. But first, on behalf of all Marines, their families and our civilian employees, I want to thank you for your continued generous support for our Marines in OPERATION ENDURING FREEDOM, OPERATION NEW DAWN, and other contingencies.

### INTRODUCTION

Safeguarding Marines is one of our highest priorities and is one of our most challenging. Our adversaries rapidly change their tactics, techniques, and procedures. Our goal has been to field new or updated systems in response to these new threats and increase the effectiveness of our systems while reducing weight for both individual protection and vehicle armoring. The bottom line is that we remain faithful to our enduring and legislated mission – to be ready wherever, whenever our country needs us and to prevail over whatever challenges we face.

In this environment of irregular warfare, the Marine Corps must be able to adapt to broad strategic conditions and wide-ranging threats. We have done this, and will continue to do so. However, we do not accomplish this in a vacuum. As your United States Marine Corps Acquisition Command, we work closely and collaboratively with Joint Improvised Explosive Device Defeat Organization (JIEDDO) and our Army counterparts in Program Executive Officer (PEO) Soldier, PEO Combat Support & Combat Service Support, PEO Ground Combat Systems, PEO Missile and Space, and the US Army Research, Development and Engineering Command to name a few.

Together, we have developed acquisition practices for our equipment that will make it more modular and scalable and to

allow us to increase or decrease armor protection and its associated weight according to the commander's assessment of mission requirements and threat. Speed and maneuverability provide an inherently measure of protection. This means that there will be times when Marines and vehicles are armored significantly less than they are today; but, by removing some armor, mobility and speed will increase. These decisions are not taken lightly but they are absolutely necessary to accomplish our mission, especially in the current fight in Afghanistan. We have ensured that our commanders in the field down to the Lieutenant Colonel/Battalion Commander level have the flexibility and the ability to tailor equipment sets to match the threat, the operating environment, and demands of the mission.

Congressional support for our force protection efforts has been overwhelming. We have globally sourced equipment to our Marines in Afghanistan. They have all the gear that they require. Some of that gear came from home stations, but we continue to provide the requisite equipment that is needed for training by units in the Pre-deployment Training Program. We thank you and ask that Congress continue their life-saving support in the coming years.

#### **FORCE PROTECTION SYSTEM PROCUREMENT METHODOLOGY**

The Marine Corps is committed to providing force protection equipment to save Marines' lives, reduce Marine casualties, and limit the severity of our casualties. Another one of our goals is to ensure that all of our in-theater force protection requirements are quickly met with the best systems available. There are no commercially available force protection products more capable of saving our warfighters' lives and reducing

injuries in combat than the equipment and systems we are fielding today.

The protection of our Marines is paramount and while body and vehicle armor are life savers, other methods for protecting our Marines are equally as important. Success in combat depends upon leaders who can adapt and make sound, timely decisions on a constantly changing, fluid battlefield. A Joint Force Commander achieves success in his assigned mission based on the factors of mission, enemy, terrain and weather, troops and support available, and time available (METT-T). Therefore, our protection philosophy must also include training our leaders in personal protective measures that provide flexibility and protection scalability.

Our commanders have the flexibility to adjust protection levels as the situation dictates and provide scalability of personal protection equipment, both personal and vehicular, that provides levels of protection that reduce the burden on our Marines and equipment.

#### GROUND MOBILITY

The evolving threat environment requires proactive management of tactical wheeled vehicle programs in order to provide Marine warfighters with the most well-protected, safest vehicles possible given technological limitations. The Marine Corps continues to work together and with user representatives, our Sister services and industry to develop, test, and incorporate upgrades to the Medium Tactical Vehicle Replacement (MTVR), Logistics Vehicle System Replacement (LVSR), Mine Resistant Ambush Protected (MRAP), MRAP-All Terrain Vehicle (M-ATV) and other Marine tactical wheeled vehicles. The Marine Corps Systems Command and Program Executive Officer Land Systems are supporting the Marine Corps Combat Development Command as

they develop an armor strategy for the Marine Corps that will address both near and long term requirements for tactical vehicle armoring.

To this end, we have developed increased force protection upgrades to the MRAP vehicles and the Medium Tactical Vehicle Replacement Armor System, and developed improved armor for the Logistics Vehicle System Replacement. We will continue to work with the Science & Technology community and with our sister Services to develop and apply technology to address force protection requirements.

### **Mine Resistant Ambush Protected (MRAP) Family of Vehicles**

The Mine Resistant Ambush Protected (MRAP) Family of Vehicles provide warfighters with multi-mission platforms capable of mitigating improvised explosive devices, underbody mines, and small arms fire threats, which are currently the greatest casualty producers in Overseas Contingency Operations.

The MRAP Family of Vehicles has grown from an initial program requirement of 1,185 in November 2006 to over 26,000 vehicles today. We have awarded contracts for a total of 25,835 vehicles toward this joint requirement. The Marine Corps is executing this joint urgent requirement to provide as many highly survivable vehicles to theater as quickly as possible. On January 4, 2010, the Joint Requirements Oversight Council validated up to an additional 4,000 MRAP family of vehicles for a total potential requirement of up to 26,882 MRAP vehicles for all Services and Special Operations Command (SOCOM).

The current Marine Corps requirement of 4,115 vehicles is comprised of four different categories of vehicles (Category (CAT) I, II, III, and MRAP-All Terrain Vehicle (M-ATV)) to support our ongoing theater operations and home station training. Marine Corps CAT I and II vehicles are receiving

Independent Suspension System (ISS) and survivability upgrades to enhance durability, mobility and survivability on the rough, mountainous terrain of Afghanistan. As part of a responsible withdrawal, MRAP vehicles are being redeployed from Iraq to support other missions. Based on theater commanders' requirements, the Services have moved over 800 MRAP vehicles from Iraq to Afghanistan.

An M-ATV production delivery order was awarded to Oshkosh Corporation for 5,244 vehicles in June 2009 and the first M-ATVs were fielded in early December 2009. We currently have 8,104 vehicles on contract with Oshkosh. The M-ATV contract includes provisions for the acquisition of up to 10,000 vehicles. As of 10 March, the government has accepted 4,606 M-ATVs from Oshkosh, a number which increases daily. They remain ahead of schedule. To date, the Services have delivered to Afghanistan over 1,200 M-ATV's for theater operations and continue to deliver ahead of schedule. Unlike the original MRAP vehicles; this lighter, more agile, MRAP variant was designed for the rugged, mountainous environment in Afghanistan.

Testing of proposed solutions to the Explosively Formed Penetrator (EFP) and Rocket Propelled Grenade threats continues as the threat evolves and solutions are developed. Testing is complete for the MRAP Expedient Armor Program, designed to upgrade the LRIP 1-9 vehicles with limited EFP protection. The Army Evaluation Center is currently preparing the final report with completion planned 3rd quarter of Fiscal Year 2010. The MRAP Family of Vehicles can have various levels of protection based upon variant and/or location.

#### Medium Tactical Vehicle Replacement (MTVR) Armor System (MAS)

For our Medium Tactical Vehicle Replacement (MTVR) 7-ton trucks, we developed the MTVR Armor System (MAS). This armor

system is a permanent modification to our MTRV fleet. It is designed for the life of the vehicle (twenty-one years). The MTRV Armor System is capable of withstanding small arms fire, improvised explosive devices, and mines. It provides complete 360 degree protection, as well as overhead and underbody protection for the cab occupants, and includes upgraded suspension, an air conditioning system, removable armored personnel carrier (with ballistic glass), and machine gun mounts.

The MAS is installed in all MTRV variants in Afghanistan. We have continued to improve the MAS in response to Urgent Universal Needs Statements - adding increased underbody blast protection, fuel tank fire protection kits, and 300 amp alternator kits (for powering Counter Improvised Explosive Devices, etc.). Every MTRV that leaves the Forward Operating Base is equipped with the MAS. The latest upgrade to the MAS incorporates a removable cab roof to support Maritime Prepositioned Shipping requirements.

#### Logistics Vehicle System Replacement (LVSR)

The Logistics Vehicle System Replacement (LVSR) is replacing the currently fielded Marine Corps' aging heavy-tactical wheeled vehicle, the Logistics Vehicle System. As the Marine Corps' heavy-tactical distribution system, the LVSR Cargo variant will transport bulk liquids (fuel and water); ammunition; standardized containers; bulk, break bulk, palletized cargo, and bridging equipment. The LVSR Wrecker variant will perform heavy wrecker/recovery missions, while the LVSR Tractor variant will tow heavy engineer equipment and combat vehicles with the M870A2 40-ton Medium Heavy Equipment Trailer (MHET). All LVSR vehicles will include a base "A" armor kit, and can accept an add-on "B" armor kit. LVSR cargo

vehicles met or exceeded all survivability requirements in extensive live fire testing. LVSR cargo vehicles with armor kits began fielding in Fiscal Year 2009 to Afghanistan, as well as to CONUS and OCONUS Marine Expeditionary Force locations, training schools, and Maritime Prepositioned Shipping.

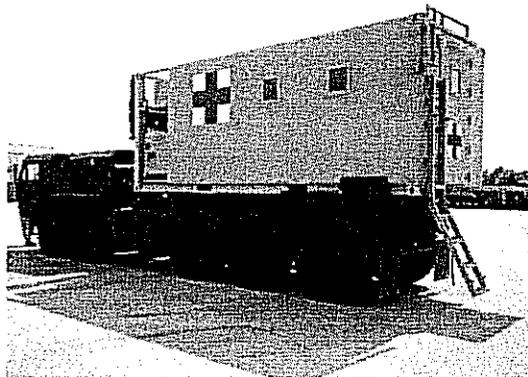
### Mine Rollers

We continue to field mine rollers to our Marines. These systems are designed to defeat pressure-plate activated mines and victim initiated improvised explosive devices. They provide full-width protection coverage for the host vehicle. The mine roller system can be used while traveling at tactical convoy speeds.

The Mine Roller System can be mounted on a variety of vehicles, including HMMWV, MTRV, Light Armored Vehicles, MRAP vehicles and the M-ATV.

As a result of the growing need and success of these fielded systems, the requirement recently increased to 560 to support OPERATION ENDURING FREEDOM and home station training. We currently have approximately 200 rollers on order at the Marine Corps Maintenance Center, Albany Georgia, and ninety on order with L3 through the Naval Surface Warfare Center (NSWC) Panama City, FL.

### Mobile Trauma Bay (MTB)



The Mobile Trauma Bay (MTB) is a modular, medical asset constructed in a 20 foot International Standards Organization (ISO) container frame, mounted on LVSR. The MTB was developed, fabricated, tested and initially fielded by a multi-disciplinary USMC medical, engineering and manufacturing team in 116 days. It provides doctors and corpsmen in a combat zone with everything, except a CAT scan machine, available in a stateside emergency room. The MTB enables the Shock Trauma Platoon to travel with combat units and conduct emergency resuscitative care at the forward edge of the battle area with a level of force protection and environmental control. The innovation has saved many lives and several limbs.

#### Ground Mobility in Closing

We have direct day-to-day communications with our U.S. Army counterparts to coordinate our force protection strategies for our ground vehicles. We are committed to aggressively evolving our equipment to changing threats. Our future tactical combat vehicles must provide the commander with balanced capabilities. These vehicles should be adequately protected, yet maneuverable and functional across the range of military operations. Where speed, tactical maneuverability, environmental and terrain considerations dictate the most important capabilities needed in our vehicles, we will carefully consider the tradeoffs in conventional heavy armor protection versus the operational requirements for performance. These tradeoffs are not taken lightly and they are done with full consideration that our Marines will be taking the vehicles into harm's way. Where possible, we are developing vehicles that include scalable protection, meaning that it will be possible, through kitted armor applications to adjust the level of protection as dictated

by the threat condition. We anticipate that as technology improves, we will be able to achieve greater degrees of ballistic and explosive protection with lighter materials. Our ability to rapidly modify our vehicle armoring systems on the MRAP and other ground vehicles is a testament to this commitment.

#### PERSONAL PROTECTION EQUIPMENT

The wartime environment in OPERATION ENDURING FREEDOM constantly changes and no one is better suited to determine the most effective personal protective equipment in any given situation than the warfighter. Therefore, we provide equipment that can be configured to meet varying levels of threat. The Marine Corps adopted policies that allow commanders - down to the Lieutenant Colonel/Battalion Commander level - the opportunity to assess risk within the environment, terrain, enemy situation, and mission and equip their Marines accordingly. Specifically, the policy of Armor Protection Levels (APL) was published to all Marines and provides an instant common understanding for specific components of body armor to be worn in a given situation. This further demonstrates that Marines on the ground will be provided the flexibility and authority to adjust the protection levels for a requisite mission while acknowledging the need to maintain superior mobility for survivability and lethality to our adversary.

In the case of body armor, we provide every Marine with a modular ballistic body armor system. All of our body armor systems accommodate the use of our existing Enhanced Small Arms Protective Inserts and our Enhanced Side Small Arms Protective Insert plates. These are the same armor plates used by the Army

and will continue to be used as we make improvements to the Modular Tactical Vest and Scalable Plate Carrier.

#### Modular Tactical Vest (MTV)

The Modular Tactical Vest (MTV) is a modular body armor system that provides load carriage capabilities in addition to indirect fire protection. In response to an Urgent Universal Needs Statement (UUNS), the Marine Corps developed and issued the MTV to satisfy OPERATION NEW DAWN AND OPERATIONA ENDURING FREEDOM requirements. The MTV currently fielded will be replaced by the Improved Modular Tactical Vest (IMTV).

#### Scalable Plate Carrier (SPC)

The Scalable Plate Carriers (SPC) is unlike any previous generation flack jacket. It provides a contoured area of coverage and lighter weight allowing our foot-mobile Marines to remain offensive and have a lethal, tactical advantage over their adversary. Coupled with the Modular Tactical Vest, the SPC provides commanders options to address various mission/threat requirements. We fielded approximately 63,500 Scalable Plate Carriers.

SPC feedback from Marine combat veterans has been clear and positive. Marines welcome protective equipment that provides identical ballistic protection at a lower weight, improving mobility in combat. The acquisition objective has been increased to approximately 65,000 plate carriers.

#### Improved Modular Tactical Vest (IMTV)

We have completed the government design for the development of an Improved Modular Tactical Vest (IMTV) and awarded a two production contracts for 108,000 vests. The IMTV uses the same soft and hard armor protective plates issued by the Marine Corps

and the Army and provides the same level of fragmentation and ballistic protection. In addition, the accoutrements (e.g., cummerbund, quad guard, groin protector, neck protector, deltoid protector, etc) from one vest can be exchanged with the plate carrier described below. All these piece parts can be attached to the other to allow the commander the ability to tailor his body armor solution for the situation at hand.

The Marine Corps teamed with engineers from the U. S. Army's Research, Development and Engineering Center in Natick, Massachusetts throughout the acquisition process and shares test and evaluation data with the Army's PEO Soldier. The acquisition objective for the IMTV is 108,000 systems. We expect fielding to begin in the 1<sup>st</sup> quarter of Fiscal Year 2011.

#### Plate Carrier (PC)

Through the overwhelming positive response to the Scalable Plate Carriers (SPC), the Marine Corps has developed a program of record for an alternative body armor option for Marines. We teamed with engineers from the U. S. Army's Research, Development and Engineering Center in Natick, Massachusetts to develop the Plate Carrier (PC). The PC improves the load bearing capabilities of the SPC, integrates primary components among the IMTV, and contours the product for comfort and wear. The acquisition objective for the PC is 108,000 systems. We expect fielding to begin in the 1<sup>st</sup> quarter of Fiscal Year 2011.

#### Enhanced Combat Helmet (ECH)

With a sense of urgency, we continue to develop an improved combat helmet for Marines and Soldiers that provides increased fragmentation and ballistic protection. We are working closely with our Army counterparts on this urgent and compelling need. While the first round of testing fell short of our expectations,

we have adjusted the program and developed a new schedule for another round of ballistic testing expected to be this Spring/Summer. This approach allows all of our vendors time to redesign their helmets to meet our requirements. Our goal is to complete successful testing as quickly as possible and begin production. The design we are working towards is to support Afghanistan with an initial Acquisition Objective of 200,000 helmets for the Army and 38,000 helmets for the Marine Corps.

#### Flame-Resistant Organization Gear (FROG)

Flame-Resistant Organization Gear (FROG) provides Marines with increased burn protection from flash fires which are unexpected, sudden intense fire caused by the ignition of flammable, liquids, vapors, gases, or dust. This system consists of an ensemble of clothing (gloves, balaclava, long sleeved flame retardant shirt, combat shirt, and combat trouser) to provide commanders with options that are modular and scalable. FROG is issued to all Marines deploying to Afghanistan. We continue to make improvements to FROG with optimal blends of Flame Resistant (FR) materials that balance durability and comfort while seeking to increase burn protection.

#### Personal Protection In Closing

It is very important to the Marine Corps that we provide robust personal protection solutions to our warfighters -- and provide these solutions immediately. Working with our nation's manufacturing base and our sister Services, the Marine Corps continues to provide the best possible levels of personal protection to known and anticipated threats; and we remain committed to aggressively matching our equipment to changing threats.

## COUNTER-IED PROGRAMS

### Counter Radio-Controlled Improvised Explosive Device Electronic Warfare (CREW)

Every Marine vehicle in theater that travels outside of operating bases is protected by a CREW system to counter the RCIED threat. To that end, since the fielding of these systems, injuries or deaths attributed to RCIEDs have been all but eliminated.

Our CREW systems will continue to evolve to meet or stay ahead of the threat.

### Ground-Based Operational Surveillance System (G-BOSS)

The Ground-Based Operational Surveillance System (G-BOSS) is a persistent ground-based counter-IED surveillance system that provides constant and persistent display and tracking of items of interest through the use of 360° high-resolution day and night cameras with enhanced target recognition. We have three separate variants: 107'/80' Tower-mounted, 28' trailer-mounted system, and a man-portable tripod-mounted system. All three systems use color and infrared imagery, radar and Unattended Ground Sensors to accomplish their mission.

Towers are being constructed using sensors from OIF retrograde assets to fullest extent possible.

### Counter Sniper Systems

In addition to emerging technologies and materiel solutions, the Marine Corps has emphasized improved training for individual Marines and sniper teams in order to counter the threat before a shot is fired. The Marine Corps Combat Hunter

program, developed in coordination with experienced big game hunters, teaches advanced profiling, tracking and employment of optics on the battlefield. This aggressive mindset, in combination with recently fielded improved tactical binoculars, rifle day optics, night vision and thermal devices, has enabled our Marines to become the hunter, rather than the hunted.

With respect to materiel solutions, Marine Corps Warfighting Lab has explored various technology initiatives to counter the threat posed by snipers. These technologies include laser optics detection systems, man portable and vehicle-mounted acoustic systems, muzzle flash detection systems, persistent surveillance camera systems, and integrated slew to cue remote weapon stations. We have evaluated nine types of countersniper detection systems, deployed 174 end items (such as the vehicle mounted Boomerang) to Iraq and Afghanistan for evaluation, and like the Army, we are assessing the Soldier Wearable Acoustic Targeting System (SWATS)/ Expendable Acoustic Remote Sensor (EARS) individual gunshot detection system for potential transition to a formal acquisition program in 2010.

Our combat developers at Quantico have remained actively engaged with their Army counterparts. We participated on the Sniper Defeat Integrated Product Team at Fort Benning and provided subject matter experts and operating forces to develop and evaluate the Joint Sniper Defeat Handbook published in August 2008. As the Army Requirements Oversight Committee evaluates the Individual Gunshot Detection Capability Production Document (CPD), our continued involvement will provide us the ability to leverage this requirement to meet our need if desired.

The Marine Corps has approached the countersniper challenge across the full Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF)

spectrum. We conducted the comprehensive Scout Sniper Capabilities Based Analysis in 2007-2008 which identified gaps associated with countersniper missions and incorporated them into the Scout Sniper Initial Capabilities Document (ICD) approved by the Marine Corps Requirements Oversight Committee in 2008. The Scout Sniper requirement supported the Marine Corps Rapid Engagement Precision Rifle (REPR) and the Precision Sniper Rifle (PSR) requirements documents, both of which will improve the sniper team's counter-sniper capabilities. While the Marine Corps is pursuing the Army's Semi Automatic Sniper System (SASS) to meet the REPR requirement, the Army has the lead. The PSR Capability Development Document is currently being drafted by the Army combat developer with Marine Corps and Special Operations Command support.

#### CLOSING

We know the future will be challenging—not only in the immediate conflict in Afghanistan, but in subsequent campaigns and Overseas Contingencies Operations. Our enemy constantly evolves and changes his tactics. As the Marine Corps combats our enemy's current capabilities, we also prepare for future adaptations. In this environment, the Marine Corps has been able to adapt to broad strategic conditions and wide-ranging threats. We continue to protect our Marines by developing and fielding more capable systems faster and more efficiently.

We work hard to ensure the safety of our Marines by providing them with the best and most effective force protection equipment. The lives of our Marines, Soldiers, Airmen and Sailors are a precious asset and protecting them with better and more capable equipment has been, and will always be, the highest priority of the Marine Corps. Your support with continued robust, timely funds will position Acquisition Organizations

throughout the Department of Defense proactively approach the challenges and ensure our warfighters' safety. Again, thank you for your continued support.