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EQUIPPING THE INDIVIDUAL SOLDIER AND MARINE: CURRENT AND FUTURE YEAR ACQUISITION AND MODERNIZATION STRATEGIES AND THE FISCAL YEAR 2014 BUDGET REQUEST

UNITED STATES HOUSE COMMITTEE ON THE ARMED SERVICES, SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES

ONE HUNDRED AND THIRTEENTH CONGRESS, FIRST SESSION

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RECORD VERSION

STATEMENT BY

BRIGADIER GENERAL PAUL A. OSTROWSKI
PROGRAM EXECUTIVE OFFICER SOLDIER

and

MR. PETER B. BECHTEL, G-3/5/7
DIRECTOR, CAPABILITIES INTEGRATION,
PRIORITIZATION AND ANALYSIS

BEFORE THE

TACTICAL AIR AND LAND FORCES SUBCOMMITTEE
HOUSE ARMED SERVICES COMMITTEE
UNITED STATES HOUSE OF REPRESENTATIVES

ON EQUIPPING THE INDIVIDUAL SOLDIER AND MARINE: CURRENT AND FUTURE YEAR ACQUISITION AND MODERNIZATION STRATEGIES AND THE FISCAL YEAR 2014 BUDGET REQUEST

FIRST SESSION, 113TH CONGRESS

APRIL 11, 2013

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ON ARMED SERVICES

Chairman Turner, Representative Sanchez, and distinguished Members of the Subcommittee on Tactical Air and Land Forces, we thank you for this opportunity to discuss the Fiscal Year 2014 (FY14) budget request for equipping the individual Soldier and Marine. It is our privilege to represent senior Army leaders and America's Soldiers. It is also our privilege to appear before this Subcommittee with our fellow Warfighters from the U.S. Marine Corps. We thank you, Mr. Chairman, and all Subcommittee Members for your sound advice and strong support of the Army as we strive to ensure that all Soldiers are well-trained and well-equipped to undertake any mission in any environment.

Current and Future Individual Warfighter Equipment Modernization Plans and Strategies

History has shown repeatedly our nation cannot successfully accomplish its mission without the commitment of ground troops. This is why Individual Warfighter Equipment modernization is so important. A highly trained and properly equipped Soldier is the crucial and integral component of the successful employment of all Army systems. Program Executive Office (PEO) Soldier is the first organization in Army history to modernize the "Soldier as a System," thereby ensuring that everything the Soldier wears, carries and employs on the battlefield works in an integrated manner. Nearly 12 years at war have demonstrated conclusively that this integrated, comprehensive modernization strategy has saved lives, increased lethality and combat effectiveness, and improved the quality of life for Soldiers during and after their deployments.

In Fiscal Year 2012, PEO Soldier fielded more than 1.4 million items to more than 193,000 Soldiers, including individual weapons, protective equipment, body armor and flame-resistant clothing, fused night vision googles, weapon-mounted sensors, laser rangefinder and designation systems, and more. We have, without question, the best-equipped, most technologically advanced fighting force in the world, but there are still challenges that we are working to meet. For example, today's All-Volunteer, combat-seasoned Soldier has steadily borne the brunt of increased equipment load necessitating considerable attention to modernization efforts aimed at lightening that burden while maintaining a decisive advantage over any potential adversary. This is an important element of our modernization plan.

The Army's equipment modernization strategy ensures our Soldiers have the right equipment, for the right missions, at the right time by procuring versatile and tailorable equipment that is effective, sustainable, and affordable. We must equip the Army for many missions, under many conditions and evolving threats. The Army's guiding principles include the following:

- **Enhance Soldiers for broad Joint Mission Sets**: Provide improvements by fielding technologies that empower, protect, and unburden Soldiers and formations, thus providing equipment at the earliest time to better accomplish the mission;
- **Remain Prepared for Decisive Action**: Facilitate fleet capabilities to increase lethality and mobility while optimizing survivability and

sustainability. Manage the full suite of capabilities enabling the most stressing Joint war fights.

These principles are prioritized into five Army priorities for the Soldier Portfolio: Network, Lethality, Training and Leader Development, Mobility, and Force Protection.

- **Network**: Army forces require communication systems and devices that allow connectivity for situational awareness across the force and over distances that span the joint operational area.
- **Lethality**: The Army requires the capability to incapacitate or destroy enemy personnel, materiel, and infrastructure across the full spectrum of joint operations.
- **Training and Leader Development**: Training is the critical base of all Army units and proper training is the foundation on which all other enabling technologies are applied. The Soldier must be trained to operate in complex environments, among various cultures, in coordination with host nations and allied partners.
- **Mobility**: Army forces require mobile protected firepower that can maneuver over long distances while maintaining power requirements in austere environments. Reducing the load weight of the Soldier will enhance his/her mobility and further reduce fatigue.
- **Force Protection**: Soldiers require protection to close with and defeat the enemy, conduct effective reconnaissance and security operations, develop the situation through action, and adapt continuously to changing situations. Soldier protection must have tailorable and scalable protection from small arms, IEDs, blast and fragmentation,

the ability to measure and mitigate blast effects in order to reduce incapacitation on the individual Soldier.

To accomplish these principles and priorities we must synchronize our requirements, acquisition, sustainment and resourcing processes to ensure that leadership can make informed decisions in a timely manner to meet the needs of our Soldiers.

The Army's strategic modernization planning combines a detailed analysis of investments in science and technology, and materiel development linked to emerging threats and capability gaps across a long-term, 30-year period. This will produce a detailed road map of our future capabilities across the acquisition lifecycle, and link our S&T investments with our Programs of Record, which we linked to our long-term sustainment strategy.

PEO Soldier hosted a detailed process review with key leaders from the Army requirements generation community, various Science and Technology (S&T) organizations and representatives from our user community. The review was the culmination of several months of effort focused on synchronizing schedules and aligning capability gaps to requirements, technology efforts and programs of record to obtain senior leader concurrence for a collaborative process that will support the materiel development, S&T and requirements communities and will result in a strategic Soldier modernization plan.

Other Key Improvement and Integration Efforts

We fielded new body armor that is better fitting and thus more comfortable for female Soldiers. TIME magazine named it one of the “Best inventions of the Year 2012.” A collaborative effort between the Natick Soldier Research, Development and Engineering Center and PEO Soldier resulted in an Improved Outer Tactical Vest (IOTV) designed specifically for women, allowing them to perform their missions more effectively. The 101st Airborne Division’s 1st Brigade is the first unit equipped with the new female body armor in Afghanistan.

It was through our collaboration with our sister Services that we realized the benefit of a tailored combat uniform. Recognizing that the Army is comprised of 14 percent women, we recently completed the evaluation of the Army Combat Uniform-Alternate (ACU-A) to meet their needs. The ACU-A fits the female body better and provides a better fit for some small-statured male Soldiers. A Human Factors study conducted on our new female uniform last year at Fort Polk, LA, found that issues of restriction and discomfort were few in number and feedback on this new uniform is positive. The ACU-A will be introduced as an alternative item into the clothing bag for all Soldiers in May 2013.

We have an initiative underway to develop a potential family of uniform patterns that could provide better concealment by an expeditionary Army in multiple environments worldwide. Perhaps more importantly, we are seeking a single pattern for our Organizational Clothing & Individual Equipment that would work in concert with the

family of uniform patterns. We are working with our sister Services on this initiative for possible DoD-wide use.

In other areas, the Pelvic Protection System (PPS) reflects our commitment to protect the Soldier. In this effort, we worked closely with our British counterparts at the inception of the effort and then extremely close with both the USMC and USSOCOM. The Army has procured more than Pelvic Protection Systems in response to a Warfighter request for increased protection from blast events impacting the pelvis, femoral arteries, and lower abdominal organs. To date, we have fielded more than 60,881 complete sets to units in Afghanistan. The PPS is saving lives.

The Army has developed the Generation II Helmet Sensor as an operational predictive tool to capture data for injury subsequent to a blast event. Some day the medical community can use those data to diagnose, and develop treatments for Mild Traumatic Brain Injuries more effectively. To date, we have fielded 19,000 helmet sensors to deploying Soldiers.

PEO Soldier is a key player to the Army's Operational Energy Initiative. Soldier Power encompasses expeditionary power solutions intended for the most austere operating environment. These solutions include Soldier power generation systems, power scavenging, renewable energy, power distribution, power management, and power storage solutions that are lightweight and Soldier portable or wearable. Soldier Power is a key enabler for dismounted combat operations. Providing energy alternatives to the most disadvantaged Warfighter will allow a small unit to sustain itself throughout

extended missions while reducing battery load and reliance on logistics convoys. These efforts will ultimately allow us to work towards our goal of energy self sufficiency.

As we drawdown from more than a decade of conflict, it is imperative that we incorporate lessons learned from combat, emerging threats, and an assessment of where commercial technologies and capabilities are headed. We must firmly ground our efforts to pursue priority capabilities that will enable the Soldier to have decisive overmatch on the battlefield. These include both “game changers” and other areas where public investment can have the most valuable effect.

Joint Army and Marine Corps Coordination

The Army and the Marine Corps collaborate closely in providing our Warfighters with the best equipment in the world. The Army, Marine Corps and Special Operations Command conducted a detailed review of our portfolios and determined common programs and requirements that could facilitate closer collaboration in the future. These programs include protective equipment, small arms and expeditionary power to name a few. One of the major outcomes of this session revealed how closely we have been working together over the past decade and that we will work even more closely in the future.

Whenever possible, we conduct our development, testing or procurement efforts in collaboration with the other military Services and organizations to increase efficiencies across the Department of Defense (DoD). With the camouflage uniform,

helmet improvements, night vision devices and our weapons systems, we collaborate across the Department.

Perhaps the greatest area of collaboration exists in finding ways to advance weight reduction for our Warfighters. While an individual equipment load is mission-dependent, a rifleman in a squad can carry a typical load of 110lbs. The largest increase in Soldier load is because of the Outer Tactical Vests and ballistic inserts. This Soldier load weight increase is greater in the mountains of Afghanistan.

The Army, in cooperation with the Marine Corps, has sought ways to reduce weight and the support equipment burden from nearly every angle. Examples of successful modernization include lighter body armor. The Outer Tactical Vest (OTV), which, with plates, weighed 33.5 pounds for a size medium, was replaced by the Improved Outer Tactical Vest, which not only weighs approximately four pounds less than the OTV it replaced, but provides a better fit through side adjustments. The Soldier Plate Carrier System further reduces weight by approximately eight pounds depending on size and configuration achieved by reducing soft armor coverage. This lighter weight system provides field commanders with the ability to select the level of body armor needed to support the specific mission. Soldiers in Afghanistan now have flame-resistant combat uniforms and combat shirts pre-treated with insect repellant and in an appropriate camouflage pattern for the terrain. They also have two pairs of mountain combat boots and a machine gun that is nine pounds lighter.

In Soldier Power, we are developing ways to provide lightweight power solutions. Soldiers now carry equipment that requires increasing amounts of power. The

Conformal Battery is an ergonomic Soldier-worn battery. It provides a central source of power for a variety of capabilities. The ergonomic engineering of the Conformal Battery provides Soldiers with a lightweight power that shares space with existing equipment on the Soldier's combat uniform.

We developed body armor to provide the best protection for the least weight. We designed it with the optimum set of ballistic materials and layering structures to ensure our Soldiers are survivable from current and future threats. Our next generation personal protective equipment, the Soldier Protection System (SPS), will challenge industry to reduce weight while maintaining or improving ballistic protection for our Soldiers. Our night vision and precision targeting devices are providing unparalleled capability for our Soldiers to see in low- and no-light conditions with accuracy and at greater ranges. The Army has now integrated and fused the functions of the thermal sensors and Image Intensification to provide increased capabilities in a small profile system called the Enhanced Night Vision Goggle. We continue to improve the Soldier's situational awareness to help ensure his dominance on the battlefield.

The Nett Warrior program is another example of how we have adapted to meet this weight challenge. Based on valuable Soldier feedback, we revised the Nett Warrior program to achieve substantial cost-savings and additional weight reduction that now provides superior situational awareness and understanding to ground combat leaders and small unit operations for faster and more accurate decisions in the tactical fight. Due to these adaptations and improvements, the Marine Corps is now expressing renewed interest in the Nett Warrior program.

At PEO Soldier, we strive to give our Warfighters a decisive edge to ensure they are dominant on the battlefield. With the combination of our equipment improvements as well as our increased collaboration with the Marine Corps and across the Department of Defense, our industry partners, and academia, we will ensure that our Warfighters maintain dominance on the battlefield. While certain materiel solutions may be different among the services due to slightly different mission requirements, we maintain close collaboration via joint S&T efforts, shared test events and data, and participation in each other's source selection evaluations.

Industry Partners

We are reminded daily of the hard work and dedicated efforts of our industry partners. As mentioned earlier, in Fiscal Year 2012, PEO Soldier fielded more than 1.4 million separate equipment items to deploying Soldiers. This includes fielding to Air Force and Navy Warfighters who deploy with Army units. This equipment included everything from socks to thermal sights. Our equipment modernization strategy relies on commercial technologies available now and the ability to work with industry to integrate mature incremental improvements while investing in new technologies in the future. A couple of examples include:

- Thermal Weapon Sight – We used Army acquisition procedures to reduce significantly the cost of new 17-micon sights and field them faster. Compared to the 25-micron sights, the 17 micron TWS will provide an average 15 percent

reduction in weight, 41 percent average increase in range performance across all variants, and an average battery-life improvement of 7 percent.

- ACH – The Advanced Combat Helmet (ACH) is a protective helmet consisting of a ballistic protective shell, pad suspension system, and four-point chinstrap/nape strap retention system. We test the ACH to ensure it provides ballistic and fragmentation protection for the Soldier. We use new testing protocols alongside legacy testing protocols to ensure the ACH provides Soldiers dependable head protection. Many ACH helmets include the Generation II Helmet Sensor, which records blast overpressure and forces that affect the Soldier's head during vehicle accidents, explosions or other violent incidents. The Lightweight ACH (LtWt ACH) will provide the same level of protection as the ACH but with 8 percent less weight. The ACH weighs 3.06 points while the LtWt ACH 2.81 lbs. We plan production contract awards for the Lightweight ACH in June 2013 with first deliveries expected in June 2014. We will field the LtWt ACH through attrition of older ACH helmets.
- ENVG – We reduced costs by increasing competition. We are also looking at some innovative approaches that may result in significant reductions in the cost of fused technology goggles.
- PEO Soldier is working with our industry partners to ensure we have the right equipment at the right place at the right time, and we recognize that our industry partners stand shoulder to shoulder with us as we meet the individual equipment needs of our Soldiers.

The Better Buying Power (BBP) initiative started by now Deputy Secretary of Defense Ashton Carter and Under Secretary of Defense (Acquisition, Technology and Logistics) Frank Kendall embraces a “cost-conscious culture” across the Department. This drive for efficiency enables the Army to implement management approaches that protect our ability to deliver needed Soldier capabilities—now and into the future.

For example, we are amending the acquisition strategies for the Thermal Weapon's Sights (TWS), the M4, and the Enhanced Night Vision Goggle (ENVG) to increase competition, thereby reducing the unit cost for each item. Additionally, we revised the test plan for the ENVG to make better use of existing data and reduce overall test costs.

Contracting is one area, in particular, where we have made significant strides over the last couple of years. We have taken significant steps to incentivize productivity and efficiency, including dedicated efforts to secure multiple awards that lower unit costs. The Army has embraced BBP’s call for renewed emphasis on sensible contracting strategies that support best value to the Soldier.

The long-term nature of the reduction in the discretionary caps presents challenges to the Army’s investment priorities. We must continue to meet our contingency requirements, along with our efforts to carefully balance readiness and modernization.

Our senior acquisition leaders continue an open dialogue with industry. Now, perhaps more than ever, it is clear that we must work together to identify appropriate courses of action to minimize negative impacts on our plans, programs, and partners.

Summary

Chairman Turner, Representative Sanchez, and distinguished Members of the Subcommittee, we wish to thank you again for your strong support of our Soldiers and the Army. We are part of a Joint force, constantly working to enhance the safety and security for our Warfighters. Our brave men and women in uniform display unrelenting tenacity, steadfast purpose, quiet confidence, and selfless heroism. We cannot let them down. Your wisdom and guidance is deeply appreciated as we work to ensure that our Soldiers have the right equipment, for the right missions, at the right time to successfully accomplish their missions and return home safely.

Headquarters, Department of the Army

Peter B. Bechtel

Director, Capabilities Integration, Prioritization and Analysis

Mr. Bechtel is responsible for the development, prioritization, assessment, and validation of Army current and future requirements; the review and prioritization of the Army budget and program; and, the oversight of capability portfolio management for the Army senior leadership. He develops the strategic plans and exercises management authority for key Army programs to include the Army Requirements Oversight Council and the Army Requirements and Resourcing Board, the development of the Army Planning Priorities Guidance for each PPBE cycle, and the development of Army Analysis of Alternatives guidance and Army JCIDS requirements inputs. Mr. Bechtel also chairs the Army Space Council.

Mr. Bechtel most recently served as the Deputy Director for Army Plans and Policy (DA G-35) and Director of the Army Nuclear and C-WMD Agency (USANCA) where he oversaw the formulation and integration of strategies and plans for key global strategic enabling capabilities and for regionally available multi-purpose forces. Mr. Bechtel led the Army's transformation implementation planning efforts for oversees Global Posture adjustments, the contemporary Army Force Generation (ARFORGEN) process, and future Missile Defense planning. Previously, he chaired the Army Capability Mix Panel for QDR 2006 to improve the mix of capabilities to meet the ground-domain demands of the Defense Strategy, led the Army QDR 2010 efforts for High End Asymmetric Threats, and led the Army contributions to the DoD Ballistic Missile Defense, the Nuclear Posture, and the Space Posture Reviews.

As a Combat Infantryman, Mr. Bechtel had operational deployments to Latin America and to the Persian Gulf, and additional peacekeeping and partner building deployments. He has also served as the Deputy Chief of Army War Plans Division, as an Assistant Professor of Political Science at the United States Military Academy, and as both a Strategist and the Special Assistant to the Director of the White House Office of National Drug Control Policy.

Mr. Bechtel graduated from the United States Military Academy and holds a Master of Public Administration degree from Cornell University. He is a career member of the Senior Executive Service and is a Department of Defense designated National Security Professional.

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House Armed Services Committee

STATEMENT

OF

BRIGADIER GENERAL ERIC M. SMITH
DIRECTOR, CAPABILITIES DEVELOPMENT DIRECTORATE
COMBAT DEVELOPMENT & INTEGRATION

AND

BRIGADIER GENERAL FRANK L. KELLEY
COMMANDER
MARINE CORPS SYSTEMS COMMAND

BEFORE THE

TACTICAL AIR AND LAND FORCES SUBCOMMITTEE

OF THE

HOUSE ARMED SERVICES COMMITTEE

ON

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Chairman Turner, Ranking Member Sanchez, and distinguished members of the Subcommittee, on behalf of our Marines, our families and our civilian employees, thank you for your continued and generous support for our Marines engaged in OPERATION ENDURING FREEDOM and operations around the world. It is an honor to appear before you today to discuss the capabilities we have developed and are pursuing to ensure our Marines are light, lethal and austere on the battlefield.

INTRODUCTION

As the Nation's Expeditionary Force in Readiness, the United States Marines Corps must equip each individual Marine with the right balance of lightweight and durable protection and lethality. The warfighting equipment we develop and field must allow adaptability to the harsh desert environments of the Middle East, the tropical jungle climes of the Pacific, and the urban centers of future Humanitarian Assistance/Disaster Relief missions. The Commandant has charged us with being ready to respond to today's crisis – with today's force – today.

The Marine Corps has benefited greatly from the lessons learned during almost 12 years of operations in the Middle East across the range of military operations. As we return from Afghanistan and refocus on our naval expeditionary roots, Marines will continue to answer the call "to be most ready, when the Nation is least ready." We will integrate the lessons learned about the enemies' weapon systems and their tactics, techniques, and procedures as we develop equipment for the future. The Enhanced Combat Helmet, the Improved Modular Tactical Vest and the versatile Plate Carrier are among those vital pieces of equipment. Our female Marines are serving across the battlefield in ever expanding roles, and accordingly, we are examining our equipment to determine whether adjustments are required to ensure every Marine receives the best possible protection while remaining highly mobile.

To Marines, expeditionary is a state of mind that drives the way we organize, train, and equip our forces. The squad is designed as a complex and adaptive system with the physical and intellectual agility for employment throughout the range of military operations. Each Marine within the squad has a specific mission and is equipped accordingly. The Marine Corps develops capabilities and equipment to ensure Marines are able to execute their individual tasks better than

any enemy could possibly execute his tasks. Of note, the combat load weight differs among squad members.

While working to equip the warfighter, the Marine Corps is mindful of the current fiscal environment. We continue to assess the impact of FY 13 sequestration and the associated cap reductions in FY 14 through FY21. The Marine Corps is a frugal force by nature and we continue to hold ourselves to a high standard when it comes to being good stewards of the American people's money. We will also do everything we can to equip America's sons and daughters with the equipment they need to have the best chance of returning home when we ask them to go into harm's way. Considering the present fiscal realities, one way we strive to be good stewards is through close collaboration with our Army counterparts in Program Executive Officer (PEO) Soldier, PEO Combat Support & Combat Service Support, and the Natick Soldier Research Development and Engineering Center, as well as our partners at the Office of Naval Research, and other science and technology (S&T) organizations.

We also work closely with industry to develop innovative solutions to identified requirements while keeping cost-effectiveness and sustainability in mind as we enter what could be a prolonged period of fiscal austerity. The Marine Corps recognizes the potential innovations that small-size companies can offer and is actively engaged with these businesses through Small Business Innovation Research (SBIR) projects. For example, the Next Generation Helmet System is a Marine Corps SBIR effort, with Army support, which is researching novel helmet system designs, shell shapes, and suspension and retention systems that will provide an optimized solution to protect against a myriad of operational threats (blast, ballistic, and blunt impact) while improving user comfort. Additionally, we are supporting an Alternative Lightweight Solution SBIR effort to determine the feasibility of Enhanced Small Arms Protective Insert performance at reduced weights.

Marine Corps Efforts to Equip Female Marines

For the past three years, the Marine Corps has monitored and actively supported the U.S. Army's effort to develop female specific body armor. The U.S. Army developed new prototype body armor for female soldiers based on the Improved Outer Tactical Vest (IOTV), which is being evaluated for fit and sizing. The U.S. Army has designated the IOTV as their replacement

for the Outer Tactical Vest (OTV). The OTV was previously issued and shared with the Marine Corps. We have since replaced the OTV with the Plate Carrier (PC). We will address the interim and long term solution to enhance the fit, form, and comfort of the Marine Corps Family of Body Armor to best provide ballistic protection capability across the range of Marine stature profiles. The Marine Corps is nearing completion of a comprehensive survey on the fit of torso, pelvic, and helmet ballistic protection systems. The survey will provide us a better understanding of issues specific to both smaller stature and female Marines; and comprehensive data on fit, sizing, and comfort which will be incorporated into the design of the next generation, fully integrated, Modular Scalable Protective System (MSPS). We will continue to monitor U.S. Army efforts to develop solutions to address notable issues related to size and comfort of body armor for female soldiers.

Lessons Learned

As we focus on repositioning to the Pacific, the lessons learned over the past 12 years are being leveraged. In an expeditionary environment where the theater of operations is logistically supported from the sea, Marines will tailor their equipment for the mission assigned. Expeditionary logistical resupply is a key component to reducing the burden on the Marines in the rifle squad. However, the development of modular equipment has provided an opportunity for Marines to tailor their mission equipment needs - from light loads for executing recovery of a downed pilot, to heavier loads for missions requiring direct engagement.

Lightening the Load

Lightening the Load of the individual Marine continues to be a primary focus of your Expeditionary Force in Readiness. This focus must be considered in the context of the assigned mission, the enemy threat, required maneuverability and protection levels. Modular, scalable equipment allows the Commander on the ground and in some cases the individual Marine to determine the most effective configuration of equipment for the mission.

Marine Corps policy authorizes commanders down to the lieutenant colonel/battalion commander level the authority and flexibility to tailor protection levels that their Marines must

wear based on the current mission, enemy threat and terrain - while balancing protection with mobility.

One example of tailoring the equipment to the mission is the Marine Corps Plate Carrier which was fielded to provide dismounted Marines with body armor which also provides greater mobility and reduced thermal stress. The trade-off is a reduced area of fragmentation protection. The Plate Carrier has replaced the Outer Tactical Vest as the primary ballistic vest, reflecting the emphasis of improved lethality through greater mobility. It provides a lighter weight ballistic vest that still provides sufficient protection and allows Marines to remain combat effective when operating in extreme environments. The Improved Modular Tactical Vest is fielded as a supplemental system to provide commanders with the option for an increased area of coverage as dictated by mission requirements.

The Enhanced Combat Helmet is an example of the Marine Corps efforts to provide greater protection at approximately the same or less weight as the currently fielded Lightweight Helmet and resists penetration by certain small arms rounds. The Enhanced Combat Helmet program uses the latest lightweight material technology, Ultra-High Molecular Weight Polyethylene materials, to provide increased small arms protection above what is currently provided by the Lightweight Helmet. It is a game changing achievement in materials manufacturing and production.

During developmental testing, in addition to improvements in small arms resistance to penetration, the Enhanced Combat Helmet results demonstrated 50 percent better protection against fragmentation, better blunt impact performance, and better resistance to Ballistic Transient Deformation. Further, by adopting the Modular Integrated Communications Helmet design, the Enhanced Combat Helmet provides a greater field of view, comfort and stability for the Marine. The Enhanced Combat Helmet is a collaborative effort between the Marine Corps, Navy and Army with the Marine Corps serving as the program manager lead.

The Marine Corps is committed to providing Marines with camouflage uniforms that reduce visual detection and enhance performance. The Marine Corps shares its uniform technology through multiple formal and informal venues. Formal collaborative venues include the Joint Clothing and Textile Governance Board, the Cross-Service Warfighter Equipment Board, and the Army-Marine Corps Board. Informal collaborative venues include: a Flame Resistance Technical Working Group; Commander-to-Commander and program office

interaction between US Army's PEO Soldier and Marine Corps Systems Command's Product Manager, Infantry Combat Equipment; as well as participation in technology sharing through its reliance upon the Research, Development, Test and Evaluation (RDT&E) capabilities of NSRDEC.

The Marine Corps continues to develop and improve the current uniform capability to reduce costs and mitigate current and future threats to our Marines. To reduce costs and improve the capability of the current Marine Corps Combat Utility Uniform (MCCUU), the Marine Corps is working to incorporate the flame resistant capability of the Flame Resistant Organization Gear (FROG), which will allow the enhanced combat uniform to replace the FROG. Additionally the Marine Corps is also looking at incorporating improved spectral mitigation, ballistic protection, and an improved permethrin treatment into the MCCUU as well. These improvements will be in line with proposed future Joint Combat Uniform requirements from the Joint Clothing and Textile Governance Board. The Marine Corps is also developing a tropical combat uniform and boot to support the strategic shift to the Pacific region. Marines conducting operations in hot, humid, and wet tropical environments have stated the need for improved performance over the current MCCUU and Rugged All Terrain (RAT) boot, which are designed to support operations over a broad range of operating environments but are not optimized for tropical climes. The Marine Corps tropical uniform and boot will be specifically designed and tested for tropical environments utilizing the latest textile technology to significantly reduce dry times for the uniform and boot and reduce the overall thermal strain on the Warfighter. As always, the Marine Corps will continue to develop, procure, and field uniforms that support Marines between the 5th and 95th percentile, both male and female, while ensuring the requirements of the Warfighter are met at an appropriate cost.

We are aggressively improving the energy effectiveness of our Marine's equipment as an additional aspect of lightening the load. On the individual Marine, over a dozen batteries in six different configurations are used at any given time. Centralizing and reliably distributing power on a Marine will potentially reduce the reliance upon multiple types of batteries that are currently used in systems and carried in significant quantities as spares. An effort is currently under way with the Office of Naval Research to produce a prototype of just such a system. The Marine Corps is working closely with the Army on system requirements and materiel solution development. Solar panels have been fielded to the squads as a renewable energy source for

rechargeable batteries. These systems are useful for Marines during long patrols or while manning observation positions. Power continues to be a challenging component of the Marine Corps effort to lighten the MAGTF.

We continue to work closely with the U.S. Army under their role as the Department of Defense single manager for conventional ammunition. During each budget submission, the Marine Corps and Army collaborate to ensure we align procurements to achieve cost efficiencies. In doing so, we attempt to balance our purchase with the best interest of the munitions industrial base when feasible. Further, in those areas of munitions commonality, the Marine Corps consistently leverages U.S. Army munitions RDT&E efforts to modernize our conventional ammunition stockpile and to prevent duplicative munitions investment within the Department.

The Marine Corps, is closely monitoring the efforts of the Office of Naval Research (ONR), the Joint Service Small Arms Program (JSSAP) Office and U.S. Army Research and Development Command (RDECOM), in their pursuit of Lightweight Small Arms Technology (LSAT) in the form of case-less and case-telescoped 5.56mm ammunition with the potential to provide 40 percent to 50 percent weight savings over current brass cased 5.56mm ammunition. If successful, this technology may be applied to other calibers of ammunition. The new lightweight ammunition is not compatible with existing weapons and will require a significant investment for the development and fielding of new small arms that are compatible with case-less or case-telescoped ammunition. Prototype weapons have been built to demonstrate the case-telescoped capability though engineering challenges associated with firing the case-less ammunition and the firing mechanism are currently in pre-prototype development.

With respect to future efforts on small arms, the Marine Corps, in partnership with ONR and the U.S. Army RDECOM, is investing in the development of high performance small arms barrel technology. This type of technology offers the potential to make lighter weight barrels with improved performance and barrel life and may eliminate the need to employ a second barrel with our light, medium and heavy machine guns. The barrel technology we are investigating uses high performance materials coupled with improved thermal management properties to allow engineers to make barrels smaller, thinner, and lighter while improving thermal efficiency and retaining performance at high rates of fire that may make carrying the second barrel unnecessary.

The Joint Services are working together through the Joint Service Small Arms Requirements Integration (JSSARI) working group and the Joint Service Small Arms Synchronization Team (JSSAST) to align science and technology investments with required capabilities in an effort to maximize limited resources across all Services.

Currently, we are working to replace the radios being carried by dismounted Marines that require digital data transmission. The fielded AN/PRC-117F weighs 29.4 pounds with batteries. The replacement radio, AN/PRC-117G, is 20 percent lighter than the AN/PRC-117F. It adds the data networking capability equipping the end user with a system that provides higher efficiency, greater information throughput, and expanded frequency range. These capabilities enable the Marine to communicate via Voice over Internet Protocol, Command and Control Personal Computer, Microsoft Internet Relay Chat, and deliver streaming imagery simultaneously. No other dismounted Marine Corps tactical radio maintains the ability to concurrently transmit voice and data. Most of the radio replacements are taking place in theater and will transition into CONUS as long as funding is available to support the effort.

OPTIMIZING THE INTEGRATED WARFIGHTER

Similar to the idea of skunkworks projects used in the private sector to encourage innovation, the Marine Corps established Gruntworks, also known as the Squad Integration Facility. Unique within the Department of Defense, Gruntworks analyzes how components of a Marine's equipment influence combat performance in terms of weight, bulk, flexibility and effectiveness. It evaluates planned or fielded capabilities in terms of integration on the Marine and within the squad, enables rapid prototyping of improved designs for those capabilities, and then supports re-evaluation of the improved designs using on site facilities at Gruntworks and combat experienced Marines. An indication of the unique capability and relevance of Gruntworks is the adoption of the concept by the Australians in their creation of "Diggerworks" and the continued interest from international partners such as Canada and the United Kingdom.

Gruntworks designs and refines the Marine Rifle Squad as a system. Gruntworks does not procure equipment; rather, it works with all of the Program Managers within Marine Corps Systems Command to ensure individual items are integrated into an effective combat fighting capability to deliver a balanced squad.

One of the major efforts Gruntworks has undertaken in the last several years is to envision, develop, and implement the Marine Corps Load Effects Assessment Program (MC-LEAP). The MC-LEAP consists of a combination of various obstacles traced to physically demanding infantry tasks that Marines have been encountered in Operation Iraqi Freedom and Operation Enduring Freedom. It provides an assessment and metric for base lining mobility as equipment is added or changed on the Marine in order to determine system level effects on Marines. The mobility baseline can then be used as a point of comparison for improving mobility in new requirements and systems. The Modular Scalable Protection System will be the first requirement to use this new metric. An initial evaluation of 100 Marines was completed at Camp Lejeune, NC with promising results. A follow-on effort is planned at Camp Pendleton, CA in fiscal year 2014. The Load Effects Assessment Program was adopted and is in use by Canada (CAN-LEAP) and Australia. The United Kingdom also has plans to build a system at its infantry school in Warminster. Initial runs by the Canadian Armed Forces produced data that correlates well with ours. The Army has expressed interest in the MC-LEAP, and we will continue to share data and derived requirements with the other services.

We began work in the last year to pursue a fully integrated infantry system of equipment. The effort began with the creation of the Modular Scalable Protective System (MSPS) Integrated Product Team (IPT), placing the Marine at the center of our capability development. This IPT is an initial step toward taking a system of systems approach which focuses on integration of capabilities for the Marine. The work of the IPT will result in a requirement for the MSPS and concept demonstrators for the Improved Modular Scalable Vest mentioned earlier. The MSPS requirement will drive integration of capabilities more effectively at the requirements level instead of trying to engineer them in during materiel development. This requirement will define parameters for protection, weight reduction, mobility and integration both within the system and with other capabilities. Requirements for an individual load bearing system and an individual wearable power/data management and distribution system that integrate with the MSPS will follow. This approach will reduce or eliminate the need for additional equipment to have their own power, cabling, and carrying pouches, thereby reducing the bulk and weight of the requisite combat load and improving load carriage through improved ergonomic design. The end result will be the return of mobility to the individual Marine and, by extension, the Marine Rifle Squad after years of steady degradation. The Army is taking a similar approach, and the requirements

and acquisition communities in both Services are sharing their ideas and continue to seek to collaborate where requirements and execution profiles coincide.

CLOSING

Almost twelve years of sustained combat operations have provided the Marine Corps with countless lessons learned, industrial base provided technological advancements and battle-tested equipment improvements. As we meet today there are still Marines serving on the battlefield in Afghanistan, training with our allies in Africa, and forward deployed in the Pacific. The Marine Corps will continue to strike that delicate balance between effectiveness and weight of individual equipment with the speed, endurance and survivability of the individual Marine. We owe it to our Marines to continue to improve, to continue to innovate and to continue to lighten the load of the individual Marine's equipment. Our work and your support translate to success on the battlefield and the saving of lives.

Brigadier General Francis L. Kelley, Jr.
Commander, Marine Corps Systems Command

Brigadier General Kelley, a native of Philadelphia, Pa., graduated from the University of Notre Dame in 1983 with a degree in Aerospace Engineering and was the recipient of the Naval ROTC Donald R. Bertling Award. Upon completion of Officer Candidate School (OCS), he was commissioned a Second Lieutenant in the United States Marine Corps.

In February 1984 he completed The Basic School and received orders to Pensacola, Fla., for flight training. He then proceeded to the 453rd Flight Training Squadron (FTS) at Mather Air Force Base, Calif., for electronic warfare training where he was a distinguished graduate and the recipient of the Colonel Mike Gilroy Award for leadership and training excellence.

After completing EA-6B Prowler training at Whidbey Island, Wash., Brigadier General Kelley reported to Marine Tactical Electronic Warfare Squadron 2 (VMAQ-2), where he participated in the Unit Deployment Program, in addition to Operations Desert Shield and Desert Storm as the Contingency Plans and Tactics Officer.

He received orders to Air Test and Evaluation Squadron (AIRTEVRON) FIVE (VX-5), where he was the Electronic Warfare Branch Head. He then reported to Naval Air Systems Command (NAVAIRSYSCOM) as the Avionics Systems Project Officer (ASPO) for the EA-6B.

He returned to the fleet as the Operations Officer for VMAQ-1 and then as the Assistant Operations Officer for Marine Aircraft Group 49 (MAG-49). He reported to the Pentagon as an action officer to the Deputy Assistant Secretary of the Navy(DASN) for Expeditionary Forces Program.

He attended the Marine Corps War College and taught at the Command and Staff College. He transferred to Marine Corps Systems Command (MCSC), Quantico, Va., where he was the Program Manager for Unmanned Systems. Brigadier General Kelley's next assignment was Military Assistant to Dr. Delores Etter, the Assistant Secretary of the Navy (ASN) for Research, Development and Acquisition (RDA).

In August 2007 Brigadier General Kelley was assigned to the position of MCSC's Program Manager for Training Systems (PM TRASYS) in Orlando, Fla. In August 2009 Brigadier General Kelley was reassigned as MCSC's Chief of Staff and became Commander in July 2010.

RECORD VERSION

STATEMENT BY

BRIGADIER GENERAL PAUL A. OSTROWSKI
PROGRAM EXECUTIVE OFFICER SOLDIER

and

MR. PETER B. BECHTEL, G-3/5/7
DIRECTOR, CAPABILITIES INTEGRATION,
PRIORITIZATION AND ANALYSIS

BEFORE THE

TACTICAL AIR AND LAND FORCES SUBCOMMITTEE
HOUSE ARMED SERVICES COMMITTEE
UNITED STATES HOUSE OF REPRESENTATIVES

ON EQUIPPING THE INDIVIDUAL SOLDIER AND MARINE: CURRENT AND FUTURE YEAR ACQUISITION AND MODERNIZATION STRATEGIES AND THE FISCAL YEAR 2014 BUDGET REQUEST

FIRST SESSION, 113TH CONGRESS

APRIL 11, 2013

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UNTIL RELEASED
BY THE COMMITTEE
ON ARMED SERVICES

Chairman Turner, Representative Sanchez, and distinguished Members of the Subcommittee on Tactical Air and Land Forces, we thank you for this opportunity to discuss the Fiscal Year 2014 (FY14) budget request for equipping the individual Soldier and Marine. It is our privilege to represent senior Army leaders and America's Soldiers. It is also our privilege to appear before this Subcommittee with our fellow Warfighters from the U.S. Marine Corps. We thank you, Mr. Chairman, and all Subcommittee Members for your sound advice and strong support of the Army as we strive to ensure that all Soldiers are well-trained and well-equipped to undertake any mission in any environment.

Current and Future Individual Warfighter Equipment Modernization Plans and Strategies

History has shown repeatedly our nation cannot successfully accomplish its mission without the commitment of ground troops. This is why Individual Warfighter Equipment modernization is so important. A highly trained and properly equipped Soldier is the crucial and integral component of the successful employment of all Army systems. Program Executive Office (PEO) Soldier is the first organization in Army history to modernize the "Soldier as a System," thereby ensuring that everything the Soldier wears, carries and employs on the battlefield works in an integrated manner. Nearly 12 years at war have demonstrated conclusively that this integrated, comprehensive modernization strategy has saved lives, increased lethality and combat effectiveness, and improved the quality of life for Soldiers during and after their deployments.

In Fiscal Year 2012, PEO Soldier fielded more than 1.4 million items to more than 193,000 Soldiers, including individual weapons, protective equipment, body armor and flame-resistant clothing, fused night vision googles, weapon-mounted sensors, laser rangefinder and designation systems, and more. We have, without question, the best-equipped, most technologically advanced fighting force in the world, but there are still challenges that we are working to meet. For example, today's All-Volunteer, combat-seasoned Soldier has steadily borne the brunt of increased equipment load necessitating considerable attention to modernization efforts aimed at lightening that burden while maintaining a decisive advantage over any potential adversary. This is an important element of our modernization plan.

The Army's equipment modernization strategy ensures our Soldiers have the right equipment, for the right missions, at the right time by procuring versatile and tailorable equipment that is effective, sustainable, and affordable. We must equip the Army for many missions, under many conditions and evolving threats. The Army's guiding principles include the following:

- **Enhance Soldiers for broad Joint Mission Sets**: Provide improvements by fielding technologies that empower, protect, and unburden Soldiers and formations, thus providing equipment at the earliest time to better accomplish the mission;
- **Remain Prepared for Decisive Action**: Facilitate fleet capabilities to increase lethality and mobility while optimizing survivability and

sustainability. Manage the full suite of capabilities enabling the most stressing Joint war fights.

These principles are prioritized into five Army priorities for the Soldier Portfolio: Network, Lethality, Training and Leader Development, Mobility, and Force Protection.

- **Network**: Army forces require communication systems and devices that allow connectivity for situational awareness across the force and over distances that span the joint operational area.
- **Lethality**: The Army requires the capability to incapacitate or destroy enemy personnel, materiel, and infrastructure across the full spectrum of joint operations.
- **Training and Leader Development**: Training is the critical base of all Army units and proper training is the foundation on which all other enabling technologies are applied. The Soldier must be trained to operate in complex environments, among various cultures, in coordination with host nations and allied partners.
- **Mobility**: Army forces require mobile protected firepower that can maneuver over long distances while maintaining power requirements in austere environments. Reducing the load weight of the Soldier will enhance his/her mobility and further reduce fatigue.
- **Force Protection**: Soldiers require protection to close with and defeat the enemy, conduct effective reconnaissance and security operations, develop the situation through action, and adapt continuously to changing situations. Soldier protection must have tailorable and scalable protection from small arms, IEDs, blast and fragmentation,

the ability to measure and mitigate blast effects in order to reduce incapacitation on the individual Soldier.

To accomplish these principles and priorities we must synchronize our requirements, acquisition, sustainment and resourcing processes to ensure that leadership can make informed decisions in a timely manner to meet the needs of our Soldiers.

The Army's strategic modernization planning combines a detailed analysis of investments in science and technology, and materiel development linked to emerging threats and capability gaps across a long-term, 30-year period. This will produce a detailed road map of our future capabilities across the acquisition lifecycle, and link our S&T investments with our Programs of Record, which we linked to our long-term sustainment strategy.

PEO Soldier hosted a detailed process review with key leaders from the Army requirements generation community, various Science and Technology (S&T) organizations and representatives from our user community. The review was the culmination of several months of effort focused on synchronizing schedules and aligning capability gaps to requirements, technology efforts and programs of record to obtain senior leader concurrence for a collaborative process that will support the materiel development, S&T and requirements communities and will result in a strategic Soldier modernization plan.

Other Key Improvement and Integration Efforts

We fielded new body armor that is better fitting and thus more comfortable for female Soldiers. TIME magazine named it one of the “Best inventions of the Year 2012.” A collaborative effort between the Natick Soldier Research, Development and Engineering Center and PEO Soldier resulted in an Improved Outer Tactical Vest (IOTV) designed specifically for women, allowing them to perform their missions more effectively. The 101st Airborne Division’s 1st Brigade is the first unit equipped with the new female body armor in Afghanistan.

It was through our collaboration with our sister Services that we realized the benefit of a tailored combat uniform. Recognizing that the Army is comprised of 14 percent women, we recently completed the evaluation of the Army Combat Uniform-Alternate (ACU-A) to meet their needs. The ACU-A fits the female body better and provides a better fit for some small-statured male Soldiers. A Human Factors study conducted on our new female uniform last year at Fort Polk, LA, found that issues of restriction and discomfort were few in number and feedback on this new uniform is positive. The ACU-A will be introduced as an alternative item into the clothing bag for all Soldiers in May 2013.

We have an initiative underway to develop a potential family of uniform patterns that could provide better concealment by an expeditionary Army in multiple environments worldwide. Perhaps more importantly, we are seeking a single pattern for our Organizational Clothing & Individual Equipment that would work in concert with the

family of uniform patterns. We are working with our sister Services on this initiative for possible DoD-wide use.

In other areas, the Pelvic Protection System (PPS) reflects our commitment to protect the Soldier. In this effort, we worked closely with our British counterparts at the inception of the effort and then extremely close with both the USMC and USSOCOM. The Army has procured more than Pelvic Protection Systems in response to a Warfighter request for increased protection from blast events impacting the pelvis, femoral arteries, and lower abdominal organs. To date, we have fielded more than 60,881 complete sets to units in Afghanistan. The PPS is saving lives.

The Army has developed the Generation II Helmet Sensor as an operational predictive tool to capture data for injury subsequent to a blast event. Some day the medical community can use those data to diagnose, and develop treatments for Mild Traumatic Brain Injuries more effectively. To date, we have fielded 19,000 helmet sensors to deploying Soldiers.

PEO Soldier is a key player to the Army's Operational Energy Initiative. Soldier Power encompasses expeditionary power solutions intended for the most austere operating environment. These solutions include Soldier power generation systems, power scavenging, renewable energy, power distribution, power management, and power storage solutions that are lightweight and Soldier portable or wearable. Soldier Power is a key enabler for dismounted combat operations. Providing energy alternatives to the most disadvantaged Warfighter will allow a small unit to sustain itself throughout

extended missions while reducing battery load and reliance on logistics convoys. These efforts will ultimately allow us to work towards our goal of energy self sufficiency.

As we drawdown from more than a decade of conflict, it is imperative that we incorporate lessons learned from combat, emerging threats, and an assessment of where commercial technologies and capabilities are headed. We must firmly ground our efforts to pursue priority capabilities that will enable the Soldier to have decisive overmatch on the battlefield. These include both “game changers” and other areas where public investment can have the most valuable effect.

Joint Army and Marine Corps Coordination

The Army and the Marine Corps collaborate closely in providing our Warfighters with the best equipment in the world. The Army, Marine Corps and Special Operations Command conducted a detailed review of our portfolios and determined common programs and requirements that could facilitate closer collaboration in the future. These programs include protective equipment, small arms and expeditionary power to name a few. One of the major outcomes of this session revealed how closely we have been working together over the past decade and that we will work even more closely in the future.

Whenever possible, we conduct our development, testing or procurement efforts in collaboration with the other military Services and organizations to increase efficiencies across the Department of Defense (DoD). With the camouflage uniform,

helmet improvements, night vision devices and our weapons systems, we collaborate across the Department.

Perhaps the greatest area of collaboration exists in finding ways to advance weight reduction for our Warfighters. While an individual equipment load is mission-dependent, a rifleman in a squad can carry a typical load of 110lbs. The largest increase in Soldier load is because of the Outer Tactical Vests and ballistic inserts. This Soldier load weight increase is greater in the mountains of Afghanistan.

The Army, in cooperation with the Marine Corps, has sought ways to reduce weight and the support equipment burden from nearly every angle. Examples of successful modernization include lighter body armor. The Outer Tactical Vest (OTV), which, with plates, weighed 33.5 pounds for a size medium, was replaced by the Improved Outer Tactical Vest, which not only weighs approximately four pounds less than the OTV it replaced, but provides a better fit through side adjustments. The Soldier Plate Carrier System further reduces weight by approximately eight pounds depending on size and configuration achieved by reducing soft armor coverage. This lighter weight system provides field commanders with the ability to select the level of body armor needed to support the specific mission. Soldiers in Afghanistan now have flame-resistant combat uniforms and combat shirts pre-treated with insect repellant and in an appropriate camouflage pattern for the terrain. They also have two pairs of mountain combat boots and a machine gun that is nine pounds lighter.

In Soldier Power, we are developing ways to provide lightweight power solutions. Soldiers now carry equipment that requires increasing amounts of power. The

Conformal Battery is an ergonomic Soldier-worn battery. It provides a central source of power for a variety of capabilities. The ergonomic engineering of the Conformal Battery provides Soldiers with a lightweight power that shares space with existing equipment on the Soldier's combat uniform.

We developed body armor to provide the best protection for the least weight. We designed it with the optimum set of ballistic materials and layering structures to ensure our Soldiers are survivable from current and future threats. Our next generation personal protective equipment, the Soldier Protection System (SPS), will challenge industry to reduce weight while maintaining or improving ballistic protection for our Soldiers. Our night vision and precision targeting devices are providing unparalleled capability for our Soldiers to see in low- and no-light conditions with accuracy and at greater ranges. The Army has now integrated and fused the functions of the thermal sensors and Image Intensification to provide increased capabilities in a small profile system called the Enhanced Night Vision Goggle. We continue to improve the Soldier's situational awareness to help ensure his dominance on the battlefield.

The Nett Warrior program is another example of how we have adapted to meet this weight challenge. Based on valuable Soldier feedback, we revised the Nett Warrior program to achieve substantial cost-savings and additional weight reduction that now provides superior situational awareness and understanding to ground combat leaders and small unit operations for faster and more accurate decisions in the tactical fight. Due to these adaptations and improvements, the Marine Corps is now expressing renewed interest in the Nett Warrior program.

At PEO Soldier, we strive to give our Warfighters a decisive edge to ensure they are dominant on the battlefield. With the combination of our equipment improvements as well as our increased collaboration with the Marine Corps and across the Department of Defense, our industry partners, and academia, we will ensure that our Warfighters maintain dominance on the battlefield. While certain materiel solutions may be different among the services due to slightly different mission requirements, we maintain close collaboration via joint S&T efforts, shared test events and data, and participation in each other's source selection evaluations.

Industry Partners

We are reminded daily of the hard work and dedicated efforts of our industry partners. As mentioned earlier, in Fiscal Year 2012, PEO Soldier fielded more than 1.4 million separate equipment items to deploying Soldiers. This includes fielding to Air Force and Navy Warfighters who deploy with Army units. This equipment included everything from socks to thermal sights. Our equipment modernization strategy relies on commercial technologies available now and the ability to work with industry to integrate mature incremental improvements while investing in new technologies in the future. A couple of examples include:

- Thermal Weapon Sight – We used Army acquisition procedures to reduce significantly the cost of new 17-micon sights and field them faster. Compared to the 25-micron sights, the 17 micron TWS will provide an average 15 percent

reduction in weight, 41 percent average increase in range performance across all variants, and an average battery-life improvement of 7 percent.

- ACH – The Advanced Combat Helmet (ACH) is a protective helmet consisting of a ballistic protective shell, pad suspension system, and four-point chinstrap/nape strap retention system. We test the ACH to ensure it provides ballistic and fragmentation protection for the Soldier. We use new testing protocols alongside legacy testing protocols to ensure the ACH provides Soldiers dependable head protection. Many ACH helmets include the Generation II Helmet Sensor, which records blast overpressure and forces that affect the Soldier's head during vehicle accidents, explosions or other violent incidents. The Lightweight ACH (LtWt ACH) will provide the same level of protection as the ACH but with 8 percent less weight. The ACH weighs 3.06 points while the LtWt ACH 2.81 lbs. We plan production contract awards for the Lightweight ACH in June 2013 with first deliveries expected in June 2014. We will field the LtWt ACH through attrition of older ACH helmets.
- ENVG – We reduced costs by increasing competition. We are also looking at some innovative approaches that may result in significant reductions in the cost of fused technology goggles.
- PEO Soldier is working with our industry partners to ensure we have the right equipment at the right place at the right time, and we recognize that our industry partners stand shoulder to shoulder with us as we meet the individual equipment needs of our Soldiers.

The Better Buying Power (BBP) initiative started by now Deputy Secretary of Defense Ashton Carter and Under Secretary of Defense (Acquisition, Technology and Logistics) Frank Kendall embraces a “cost-conscious culture” across the Department. This drive for efficiency enables the Army to implement management approaches that protect our ability to deliver needed Soldier capabilities—now and into the future.

For example, we are amending the acquisition strategies for the Thermal Weapon's Sights (TWS), the M4, and the Enhanced Night Vision Goggle (ENVG) to increase competition, thereby reducing the unit cost for each item. Additionally, we revised the test plan for the ENVG to make better use of existing data and reduce overall test costs.

Contracting is one area, in particular, where we have made significant strides over the last couple of years. We have taken significant steps to incentivize productivity and efficiency, including dedicated efforts to secure multiple awards that lower unit costs. The Army has embraced BBP’s call for renewed emphasis on sensible contracting strategies that support best value to the Soldier.

The long-term nature of the reduction in the discretionary caps presents challenges to the Army’s investment priorities. We must continue to meet our contingency requirements, along with our efforts to carefully balance readiness and modernization.

Our senior acquisition leaders continue an open dialogue with industry. Now, perhaps more than ever, it is clear that we must work together to identify appropriate courses of action to minimize negative impacts on our plans, programs, and partners.

Summary

Chairman Turner, Representative Sanchez, and distinguished Members of the Subcommittee, we wish to thank you again for your strong support of our Soldiers and the Army. We are part of a Joint force, constantly working to enhance the safety and security for our Warfighters. Our brave men and women in uniform display unrelenting tenacity, steadfast purpose, quiet confidence, and selfless heroism. We cannot let them down. Your wisdom and guidance is deeply appreciated as we work to ensure that our Soldiers have the right equipment, for the right missions, at the right time to successfully accomplish their missions and return home safely.

Brigadier General Paul A. Ostrowski
Program Executive Officer
Program Executive Office Soldier

Brigadier General Paul A. Ostrowski graduated from the United States Military Academy in 1985. He earned a MS degree in National Resource Strategy, as part of the Industrial College of the Armed Forces from the National Defense University in June 2006. He graduated from Joint and Combined Warfighting School at the Joint Forces Staff College in 2000. Additionally, he earned a MS degree in Systems Acquisition Management at the Naval Postgraduate School in 1996.

BG Ostrowski has more than twenty-five years experience in acquisition, operational and Joint assignments. He served as Assistant Deputy for Acquisition and Systems Management, Office of the Secretary of the Army (Acquisition, Logistics and Technology) in Washington, DC from September 2011-April 2012. He was the Executive Officer to the Commander, United States Special Operations Command, McDill Air Force Base, Florida from May 2010-September 2011. He served as the Director, Operational Test and Evaluation, as well as Program Executive Officer for Special Programs, at United States Special Operations Command, MacDill Air Force Base, Florida from June 2006-May 2010. He was the Program Manager for Counterproliferation at United States Special Operations Command, MacDill Air Force Base, Florida from July 2003-July 2005. He served as Legislative Fellow, as well as Project Leader, for the Rapid Equipping Force in both Washington, DC and during Operation Iraqi Freedom in Iraq from June 2001 to July 2003. He was the Systems Acquisition Manager for United States Special Operations Command, MacDill Air Force Base, Florida from July 1998-May 2001. He served as Chief, Fort Bragg Field Operations in the Special Products Office at Fort Bragg, North Carolina from July 1996-June 1998. He also served as a Company Grade Officer in several command and staff positions in Joint Special Operations, Special Forces and Infantry assignments.

Brigadier General Paul A. Ostrowski's awards and decorations include the Defense Superior Service Medal, Bronze Star Medal, Defense Meritorious Service Medal (with Oak Leaf Cluster), Meritorious Service Medal (with Oak Leaf Cluster), Army Commendation Medal (with 2 Oak Leaf Clusters), Joint Service Achievement Medal (with Oak Leaf Cluster), and Army Achievement Medal. Additionally, he earned the Expert Infantryman Badge, Pathfinder Badge, Parachutist Badge, Air Assault Badge, Scuba Diver Badge, Ranger Tab, Special Forces Tab and Army Staff Identification Badge.

Not for public until released by
House Armed Services Committee

STATEMENT

OF

BRIGADIER GENERAL ERIC M. SMITH
DIRECTOR, CAPABILITIES DEVELOPMENT DIRECTORATE
COMBAT DEVELOPMENT & INTEGRATION

AND

BRIGADIER GENERAL FRANK L. KELLEY
COMMANDER
MARINE CORPS SYSTEMS COMMAND

BEFORE THE

TACTICAL AIR AND LAND FORCES SUBCOMMITTEE

OF THE

HOUSE ARMED SERVICES COMMITTEE

ON

EQUIPPING THE INDIVIDUAL SOLDIER AND MARINE:
CURRENT AND FUTURE YEAR ACQUISITION AND MODERNIZATION STRATEGIES
AND THE FISCAL YEAR 2014 BUDGET REQUEST

11 APRIL 2013

Not for public until released by
House Armed Services Committee

Chairman Turner, Ranking Member Sanchez, and distinguished members of the Subcommittee, on behalf of our Marines, our families and our civilian employees, thank you for your continued and generous support for our Marines engaged in OPERATION ENDURING FREEDOM and operations around the world. It is an honor to appear before you today to discuss the capabilities we have developed and are pursuing to ensure our Marines are light, lethal and austere on the battlefield.

INTRODUCTION

As the Nation's Expeditionary Force in Readiness, the United States Marines Corps must equip each individual Marine with the right balance of lightweight and durable protection and lethality. The warfighting equipment we develop and field must allow adaptability to the harsh desert environments of the Middle East, the tropical jungle climes of the Pacific, and the urban centers of future Humanitarian Assistance/Disaster Relief missions. The Commandant has charged us with being ready to respond to today's crisis – with today's force – today.

The Marine Corps has benefited greatly from the lessons learned during almost 12 years of operations in the Middle East across the range of military operations. As we return from Afghanistan and refocus on our naval expeditionary roots, Marines will continue to answer the call "to be most ready, when the Nation is least ready." We will integrate the lessons learned about the enemies' weapon systems and their tactics, techniques, and procedures as we develop equipment for the future. The Enhanced Combat Helmet, the Improved Modular Tactical Vest and the versatile Plate Carrier are among those vital pieces of equipment. Our female Marines are serving across the battlefield in ever expanding roles, and accordingly, we are examining our equipment to determine whether adjustments are required to ensure every Marine receives the best possible protection while remaining highly mobile.

To Marines, expeditionary is a state of mind that drives the way we organize, train, and equip our forces. The squad is designed as a complex and adaptive system with the physical and intellectual agility for employment throughout the range of military operations. Each Marine within the squad has a specific mission and is equipped accordingly. The Marine Corps develops capabilities and equipment to ensure Marines are able to execute their individual tasks better than

any enemy could possibly execute his tasks. Of note, the combat load weight differs among squad members.

While working to equip the warfighter, the Marine Corps is mindful of the current fiscal environment. We continue to assess the impact of FY 13 sequestration and the associated cap reductions in FY 14 through FY21. The Marine Corps is a frugal force by nature and we continue to hold ourselves to a high standard when it comes to being good stewards of the American people's money. We will also do everything we can to equip America's sons and daughters with the equipment they need to have the best chance of returning home when we ask them to go into harm's way. Considering the present fiscal realities, one way we strive to be good stewards is through close collaboration with our Army counterparts in Program Executive Officer (PEO) Soldier, PEO Combat Support & Combat Service Support, and the Natick Soldier Research Development and Engineering Center, as well as our partners at the Office of Naval Research, and other science and technology (S&T) organizations.

We also work closely with industry to develop innovative solutions to identified requirements while keeping cost-effectiveness and sustainability in mind as we enter what could be a prolonged period of fiscal austerity. The Marine Corps recognizes the potential innovations that small-size companies can offer and is actively engaged with these businesses through Small Business Innovation Research (SBIR) projects. For example, the Next Generation Helmet System is a Marine Corps SBIR effort, with Army support, which is researching novel helmet system designs, shell shapes, and suspension and retention systems that will provide an optimized solution to protect against a myriad of operational threats (blast, ballistic, and blunt impact) while improving user comfort. Additionally, we are supporting an Alternative Lightweight Solution SBIR effort to determine the feasibility of Enhanced Small Arms Protective Insert performance at reduced weights.

Marine Corps Efforts to Equip Female Marines

For the past three years, the Marine Corps has monitored and actively supported the U.S. Army's effort to develop female specific body armor. The U.S. Army developed new prototype body armor for female soldiers based on the Improved Outer Tactical Vest (IOTV), which is being evaluated for fit and sizing. The U.S. Army has designated the IOTV as their replacement

for the Outer Tactical Vest (OTV). The OTV was previously issued and shared with the Marine Corps. We have since replaced the OTV with the Plate Carrier (PC). We will address the interim and long term solution to enhance the fit, form, and comfort of the Marine Corps Family of Body Armor to best provide ballistic protection capability across the range of Marine stature profiles. The Marine Corps is nearing completion of a comprehensive survey on the fit of torso, pelvic, and helmet ballistic protection systems. The survey will provide us a better understanding of issues specific to both smaller stature and female Marines; and comprehensive data on fit, sizing, and comfort which will be incorporated into the design of the next generation, fully integrated, Modular Scalable Protective System (MSPS). We will continue to monitor U.S. Army efforts to develop solutions to address notable issues related to size and comfort of body armor for female soldiers.

Lessons Learned

As we focus on repositioning to the Pacific, the lessons learned over the past 12 years are being leveraged. In an expeditionary environment where the theater of operations is logistically supported from the sea, Marines will tailor their equipment for the mission assigned. Expeditionary logistical resupply is a key component to reducing the burden on the Marines in the rifle squad. However, the development of modular equipment has provided an opportunity for Marines to tailor their mission equipment needs - from light loads for executing recovery of a downed pilot, to heavier loads for missions requiring direct engagement.

Lightening the Load

Lightening the Load of the individual Marine continues to be a primary focus of your Expeditionary Force in Readiness. This focus must be considered in the context of the assigned mission, the enemy threat, required maneuverability and protection levels. Modular, scalable equipment allows the Commander on the ground and in some cases the individual Marine to determine the most effective configuration of equipment for the mission.

Marine Corps policy authorizes commanders down to the lieutenant colonel/battalion commander level the authority and flexibility to tailor protection levels that their Marines must

wear based on the current mission, enemy threat and terrain - while balancing protection with mobility.

One example of tailoring the equipment to the mission is the Marine Corps Plate Carrier which was fielded to provide dismounted Marines with body armor which also provides greater mobility and reduced thermal stress. The trade-off is a reduced area of fragmentation protection. The Plate Carrier has replaced the Outer Tactical Vest as the primary ballistic vest, reflecting the emphasis of improved lethality through greater mobility. It provides a lighter weight ballistic vest that still provides sufficient protection and allows Marines to remain combat effective when operating in extreme environments. The Improved Modular Tactical Vest is fielded as a supplemental system to provide commanders with the option for an increased area of coverage as dictated by mission requirements.

The Enhanced Combat Helmet is an example of the Marine Corps efforts to provide greater protection at approximately the same or less weight as the currently fielded Lightweight Helmet and resists penetration by certain small arms rounds. The Enhanced Combat Helmet program uses the latest lightweight material technology, Ultra-High Molecular Weight Polyethylene materials, to provide increased small arms protection above what is currently provided by the Lightweight Helmet. It is a game changing achievement in materials manufacturing and production.

During developmental testing, in addition to improvements in small arms resistance to penetration, the Enhanced Combat Helmet results demonstrated 50 percent better protection against fragmentation, better blunt impact performance, and better resistance to Ballistic Transient Deformation. Further, by adopting the Modular Integrated Communications Helmet design, the Enhanced Combat Helmet provides a greater field of view, comfort and stability for the Marine. The Enhanced Combat Helmet is a collaborative effort between the Marine Corps, Navy and Army with the Marine Corps serving as the program manager lead.

The Marine Corps is committed to providing Marines with camouflage uniforms that reduce visual detection and enhance performance. The Marine Corps shares its uniform technology through multiple formal and informal venues. Formal collaborative venues include the Joint Clothing and Textile Governance Board, the Cross-Service Warfighter Equipment Board, and the Army-Marine Corps Board. Informal collaborative venues include: a Flame Resistance Technical Working Group; Commander-to-Commander and program office

interaction between US Army's PEO Soldier and Marine Corps Systems Command's Product Manager, Infantry Combat Equipment; as well as participation in technology sharing through its reliance upon the Research, Development, Test and Evaluation (RDT&E) capabilities of NSRDEC.

The Marine Corps continues to develop and improve the current uniform capability to reduce costs and mitigate current and future threats to our Marines. To reduce costs and improve the capability of the current Marine Corps Combat Utility Uniform (MCCUU), the Marine Corps is working to incorporate the flame resistant capability of the Flame Resistant Organization Gear (FROG), which will allow the enhanced combat uniform to replace the FROG. Additionally the Marine Corps is also looking at incorporating improved spectral mitigation, ballistic protection, and an improved permethrin treatment into the MCCUU as well. These improvements will be in line with proposed future Joint Combat Uniform requirements from the Joint Clothing and Textile Governance Board. The Marine Corps is also developing a tropical combat uniform and boot to support the strategic shift to the Pacific region. Marines conducting operations in hot, humid, and wet tropical environments have stated the need for improved performance over the current MCCUU and Rugged All Terrain (RAT) boot, which are designed to support operations over a broad range of operating environments but are not optimized for tropical climes. The Marine Corps tropical uniform and boot will be specifically designed and tested for tropical environments utilizing the latest textile technology to significantly reduce dry times for the uniform and boot and reduce the overall thermal strain on the Warfighter. As always, the Marine Corps will continue to develop, procure, and field uniforms that support Marines between the 5th and 95th percentile, both male and female, while ensuring the requirements of the Warfighter are met at an appropriate cost.

We are aggressively improving the energy effectiveness of our Marine's equipment as an additional aspect of lightening the load. On the individual Marine, over a dozen batteries in six different configurations are used at any given time. Centralizing and reliably distributing power on a Marine will potentially reduce the reliance upon multiple types of batteries that are currently used in systems and carried in significant quantities as spares. An effort is currently under way with the Office of Naval Research to produce a prototype of just such a system. The Marine Corps is working closely with the Army on system requirements and materiel solution development. Solar panels have been fielded to the squads as a renewable energy source for

rechargeable batteries. These systems are useful for Marines during long patrols or while manning observation positions. Power continues to be a challenging component of the Marine Corps effort to lighten the MAGTF.

We continue to work closely with the U.S. Army under their role as the Department of Defense single manager for conventional ammunition. During each budget submission, the Marine Corps and Army collaborate to ensure we align procurements to achieve cost efficiencies. In doing so, we attempt to balance our purchase with the best interest of the munitions industrial base when feasible. Further, in those areas of munitions commonality, the Marine Corps consistently leverages U.S. Army munitions RDT&E efforts to modernize our conventional ammunition stockpile and to prevent duplicative munitions investment within the Department.

The Marine Corps, is closely monitoring the efforts of the Office of Naval Research (ONR), the Joint Service Small Arms Program (JSSAP) Office and U.S. Army Research and Development Command (RDECOM), in their pursuit of Lightweight Small Arms Technology (LSAT) in the form of case-less and case-telescoped 5.56mm ammunition with the potential to provide 40 percent to 50 percent weight savings over current brass cased 5.56mm ammunition. If successful, this technology may be applied to other calibers of ammunition. The new lightweight ammunition is not compatible with existing weapons and will require a significant investment for the development and fielding of new small arms that are compatible with case-less or case-telescoped ammunition. Prototype weapons have been built to demonstrate the case-telescoped capability though engineering challenges associated with firing the case-less ammunition and the firing mechanism are currently in pre-prototype development.

With respect to future efforts on small arms, the Marine Corps, in partnership with ONR and the U.S. Army RDECOM, is investing in the development of high performance small arms barrel technology. This type of technology offers the potential to make lighter weight barrels with improved performance and barrel life and may eliminate the need to employ a second barrel with our light, medium and heavy machine guns. The barrel technology we are investigating uses high performance materials coupled with improved thermal management properties to allow engineers to make barrels smaller, thinner, and lighter while improving thermal efficiency and retaining performance at high rates of fire that may make carrying the second barrel unnecessary.

The Joint Services are working together through the Joint Service Small Arms Requirements Integration (JSSARI) working group and the Joint Service Small Arms Synchronization Team (JSSAST) to align science and technology investments with required capabilities in an effort to maximize limited resources across all Services.

Currently, we are working to replace the radios being carried by dismounted Marines that require digital data transmission. The fielded AN/PRC-117F weighs 29.4 pounds with batteries. The replacement radio, AN/PRC-117G, is 20 percent lighter than the AN/PRC-117F. It adds the data networking capability equipping the end user with a system that provides higher efficiency, greater information throughput, and expanded frequency range. These capabilities enable the Marine to communicate via Voice over Internet Protocol, Command and Control Personal Computer, Microsoft Internet Relay Chat, and deliver streaming imagery simultaneously. No other dismounted Marine Corps tactical radio maintains the ability to concurrently transmit voice and data. Most of the radio replacements are taking place in theater and will transition into CONUS as long as funding is available to support the effort.

OPTIMIZING THE INTEGRATED WARFIGHTER

Similar to the idea of skunkworks projects used in the private sector to encourage innovation, the Marine Corps established Gruntworks, also known as the Squad Integration Facility. Unique within the Department of Defense, Gruntworks analyzes how components of a Marine's equipment influence combat performance in terms of weight, bulk, flexibility and effectiveness. It evaluates planned or fielded capabilities in terms of integration on the Marine and within the squad, enables rapid prototyping of improved designs for those capabilities, and then supports re-evaluation of the improved designs using on site facilities at Gruntworks and combat experienced Marines. An indication of the unique capability and relevance of Gruntworks is the adoption of the concept by the Australians in their creation of "Diggerworks" and the continued interest from international partners such as Canada and the United Kingdom.

Gruntworks designs and refines the Marine Rifle Squad as a system. Gruntworks does not procure equipment; rather, it works with all of the Program Managers within Marine Corps Systems Command to ensure individual items are integrated into an effective combat fighting capability to deliver a balanced squad.

One of the major efforts Gruntworks has undertaken in the last several years is to envision, develop, and implement the Marine Corps Load Effects Assessment Program (MC-LEAP). The MC-LEAP consists of a combination of various obstacles traced to physically demanding infantry tasks that Marines have been encountered in Operation Iraqi Freedom and Operation Enduring Freedom. It provides an assessment and metric for base lining mobility as equipment is added or changed on the Marine in order to determine system level effects on Marines. The mobility baseline can then be used as a point of comparison for improving mobility in new requirements and systems. The Modular Scalable Protection System will be the first requirement to use this new metric. An initial evaluation of 100 Marines was completed at Camp Lejeune, NC with promising results. A follow-on effort is planned at Camp Pendleton, CA in fiscal year 2014. The Load Effects Assessment Program was adopted and is in use by Canada (CAN-LEAP) and Australia. The United Kingdom also has plans to build a system at its infantry school in Warminster. Initial runs by the Canadian Armed Forces produced data that correlates well with ours. The Army has expressed interest in the MC-LEAP, and we will continue to share data and derived requirements with the other services.

We began work in the last year to pursue a fully integrated infantry system of equipment. The effort began with the creation of the Modular Scalable Protective System (MSPS) Integrated Product Team (IPT), placing the Marine at the center of our capability development. This IPT is an initial step toward taking a system of systems approach which focuses on integration of capabilities for the Marine. The work of the IPT will result in a requirement for the MSPS and concept demonstrators for the Improved Modular Scalable Vest mentioned earlier. The MSPS requirement will drive integration of capabilities more effectively at the requirements level instead of trying to engineer them in during materiel development. This requirement will define parameters for protection, weight reduction, mobility and integration both within the system and with other capabilities. Requirements for an individual load bearing system and an individual wearable power/data management and distribution system that integrate with the MSPS will follow. This approach will reduce or eliminate the need for additional equipment to have their own power, cabling, and carrying pouches, thereby reducing the bulk and weight of the requisite combat load and improving load carriage through improved ergonomic design. The end result will be the return of mobility to the individual Marine and, by extension, the Marine Rifle Squad after years of steady degradation. The Army is taking a similar approach, and the requirements

and acquisition communities in both Services are sharing their ideas and continue to seek to collaborate where requirements and execution profiles coincide.

CLOSING

Almost twelve years of sustained combat operations have provided the Marine Corps with countless lessons learned, industrial base provided technological advancements and battle-tested equipment improvements. As we meet today there are still Marines serving on the battlefield in Afghanistan, training with our allies in Africa, and forward deployed in the Pacific. The Marine Corps will continue to strike that delicate balance between effectiveness and weight of individual equipment with the speed, endurance and survivability of the individual Marine. We owe it to our Marines to continue to improve, to continue to innovate and to continue to lighten the load of the individual Marine's equipment. Our work and your support translate to success on the battlefield and the saving of lives.

Brigadier General Eric M. Smith
Director, Capabilities Development Directorate

Brigadier General Smith is from Plano, Texas and entered the Marine Corps in 1987 through the NROTC program at Texas A&M University. After completing The Basic School and Infantry Officer's Course, he was assigned to 2nd Battalion, 3rd Marines; participating in Operations Desert Shield / Desert Storm. Following a tour as an Officer Selection Officer, he attended the Amphibious Warfare School and then reported to 2nd Battalion, 2nd Marines for duty as Commanding Officer of Weapons and E Companies. During this tour he participated in Operation Assured Response in Monrovia, Liberia. After a tour as a Marine Officer Instructor at Texas A&M University, he attended the United States Army Command and General Staff Course. The following assignment was as the Naval Section Chief at the U.S. Military Group in Caracas, Venezuela from 2001-2003.

From 2003 until 2006, he served in the First Marine Division as the Division Operations Officer; Executive Officer of Regimental Combat Team 1; Commanding Officer of 1st Battalion, 5th Marines; and Assistant Chief of Staff G3. During this time he completed two deployments to Iraq in support of Operation Iraqi Freedom. Subsequent assignments were as a student at the Marine Corps War College, Senior Aide to the Commandant of the Marine Corps, and Director of the Fires and Maneuver Integration Division at the Marine Corps Combat Development Command. From 2009 until 2012 service included tours in the 2nd Marine Division as the Assistant Chief of Staff G3 and Commanding Officer of 8th Marine Regiment; completing a one year deployment to Afghanistan in support of Operation Enduring Freedom. In June of 2012 he assumed his current duties as the Director for Capability Development.