

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 climates. 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.